POPULAR Computing WEEKLY

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This Week

News Desk

16K Oric — production delayed

ORIC's wish to manufacture a sub-£100 colour computer will have to wait a little longer to be fulfilled

The 16K Oric 1 will not now become available until late May or early June

This setback comes after earlier indications of problems with 16K production (see *Popular Computing Weekly* March 17) The delay results in part from technical difficulties with the design and in part from increased demand for the 48K machine

Oric's Managing Director Barry Muncaster explained that originally both versions used the same basic design

We would have had no problems if the specification of a particular chip had not changed just prior to manufacture he said

"This however did alter resulting in us having to completely change the 16K version printed-circuit board design — which from start up to pro-

Continued on page 5



Commodore—'No' to home-taping

COMMODORE is actively looking at ways of stopping home-copying of its software With libraries and exchange clubs proliferating the problem is rapidly growing in importance

Stopping individual libraries is very difficult commented Commodore's Marketing Manager John Baxter Industries much larger than our own — the record and video businesses for example — are trying hard to fight a similar sort of problem and are failing so there is no easy solution

At the end of the day we have to stop the whole process of home-duplication and the industry must get together and develop a system to fight it

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Classified

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WINDOW ON ANOTHER WORLD
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Production Editor
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How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted.

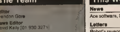
All submissions should be typed and a double space should be left between each line. Please leave wide margins.

Programs should whenever possible be computer printed.

We cannot guarantee to return every submitted article or program so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

This Week



Editorial

The Data Protection Bill currently passing through Parliament is designed to protect the public (ie you and me) from any governmental misuse of information held in computerised data banks. In brief, the Bill purports to restrict access to information held in computers while giving individuals the opportunity of checking the validity of such information.

This would seem to be a worthy aim and, in the absence of any Freedom of Information Act, a sensible precaution. However, the Data Protection Bill, in its present form, is opposed by such groups as the British Medical Association, the Law Society and the National Council for Civil Liberties.

There are a number of reasons for this opposition, chief among them the fact that some government computers will be exempt from the Bill. Thus, information on such sensitive topics as immigration, crime and tax will be passed freely from one government department to another, but will not be available to the individuals concerned.

With more and more information being held in computers, some sort of data protection legislation is obviously needed. However, that legislation should be linked to a series of safeguards that give the individual a right of appeal. Hopefully, the Data Protection Bill will be amended to include such safeguards.

Next Thursday

Dare you try your luck in Death Wall? Do you think you can outwit the computer, and prevent yourself from being electrocuted, in this all-action game for the Dragon 32 by Mark Perry?

Also next week, a review of Vic20 games by Mike Greca



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Home-taping

Continued from page 1

At present, Commodore is looking closely at two possible approaches. "If necessary we can concentrate on Rom software or material on discs with protection systems," he said, "but we are also looking at changing the design of our cassette player to make it incompatible with a normal audio player."

Commodore is in a good position to adopt such a system because both the Vic20 and 64 computers use a dedicated cassette player.

"What we are looking for is a method of using a data cassette in conjunction with our C2N cassette unit in such a way that if you copy the cassette on a domestic recorder you will get a corrupted tape program."

Commodore, along with other manufacturers, is under increasing pressure from public lending libraries who wish to offer a software lending service. Already one library — Thanet — is offering a small-scale loan facility.

16K Oric

Continued from page 1

duction has taken 12 weeks.

"The 16K has had to be viewed, from the manufacturing point of view, as a totally different product," he commented. "This has caused a delay."

Oric MD Barry Muncaster

Existing mail order customers who have ordered the 16K machine have been sent 48K models on "extended loan" and they will apparently be replaced when the 16K unit becomes available.

The 16K version is the second of the series to run into production difficulties. A 32K version was announced in November and shelved in January because of a chip incompatibility problem.

Software boost for Jupiter Ace

ACE owners are soon to get a shot in the arm — a much needed software transfusion from the machine's manufacturer, Jupiter Cantab.

A range of nine cassettes will be available at the beginning of April, followed by another seven a fortnight later.

Three of the first wave are 19K programs designed to be used in conjunction with a 16K Ram pack which will go on sale at the same time. These are *Gobbledegook*, *Zombies and Potholes* and an *Othello*-type game.

Five of the remaining six tapes each contain a pair of 3K games: *Moo/Hangman*, *Fish/Flutterer*, *Greedy Gobbler/Blow up the World*, *Missile Man/Space Fighter-pilot* and *Overtaker/Brands Hatch*. The last three tapes have been commissioned by Jupiter Cantab from Micromega.

The final tape is *Monitor* — a 3K programming tool to display the content of the memory.

All of the tapes will be available from Jupiter Cantab, 22 Foxhollow, Bar Hill, Cambridge. The 19K programs are priced at £7.95. The others are £5.95.

The 16K Ram pack — available at the end of March — will cost £34.95. A 48K Ram pack will follow a few weeks later and will cost £79.95.

Longer term plans include a combined RS232/Centronics interface board, available in the summer and priced around £40.

"We are also looking at the possibility of a colour card for the Ace — there is provision for it on the computer," commented Jupiter co-founder Steve Vickers.

However, he denied reports that a new machine is in an advanced stage of development. "Obviously we have got our ideas but we are not intending to bring out another machine this year."

● Stonechip Electronics has launched a 16K add-on Ram pack for the Jupiter Ace machine. Called the Pacer, the unit costs £29.95 and is available by mail-order from Stonechip Electronics, Unit 9, The Brook Industrial Estate, Deadbrook Lane, Aldershot, Hants.

Spectrum low-cost printer

A PACKAGE has been produced which allows the Sinclair Spectrum to run the Tandy low-cost printer/plotter.

Hampshire-based Softest has developed the hardware/software combination to do the work. For £35 the company will supply the connector and the software to drive the system.

The cassette program is supplied in three parts. The first provides the machine-code to interface the two machines — the so-called hand shaking protocol. The second provides a *List* facility. The third gives routines adding commands to the Sinclair Basic used to address the printer from the Spectrum keyboard.

The Tandy CGP-115 four-colour printer offers two modes of operation — text or graphics — uses plain paper of 96mm width in two formats — 40 and 80 character lines — and costs only £149.

Using the Softest interface the mode, format, pen colour, pen start and stop position and origin may all be selected from the computer keyboard.

Explained Softest's Chandra Fernando: "The Tandy printer/plotter costs about a fifth of the price of its nearest competition, so it seemed logical to interface it with the Spectrum."

Although the Tandy printer has both Centronics and RS232 ports — the Spectrum has neither.

Further details of the interface from Softest, 10 Richmond Lane, Romsey, Hants.

Prestel adaptor put on ice

PLANS for a Prestel adaptor for the ZX81 and Spectrum microcomputers have been dropped by Sinclair Research.

"The project has not been killed dead — just frozen," said a company spokesman. "The decision has been made not for any technical reason — more because at present we feel there is no market for it. The engineering effort is being fed into other areas."

Micronet 800, the Prestel-based computer database, is working on its own adaptor for the Sinclair machines.

The unit should be available in early May at a price in the £50-£70 range.

The Micronet service was launched at the end of February and now has over 1000 subscribers.

Donkey Kong treads the boards

BOARD GAME manufacturer Milton Bradley is moving into the arcade arena.

The company is producing a range of traditional games based on arcade favourites. The first three are Donkey Kong, Pac-Man *and* Frogger. Berserk, Defender *and* Zaxxon *are to follow shortly.*

"We are reversing the current trend and in so doing making these games so that the whole family can play them," commented a spokesman for the company.

The games cost £8.50 each. More information from Milton Bradley, 97/107 Uxbridge Road, Ealing, London.

Bugs and all

I have been reading recently of the launch of the ZX Spectrum computer in the United States. According to various reports, the American version will not only be cheaper than in the UK but will be enhanced with such goodies as a three channel sound chip, games cartridge slot, auto-line number, renumber, etc. The American versions of the ZX81 and the ZX printer are also better than the ones we see here.

It seems to me that in the UK we have the first prototype rushed on to the market — bugs and all — followed by weeks of waiting while things are sorted out. Then, the American market has the benefit of a polished and enhanced machine as a result of the UK problems. Surely the enhanced machines should be available on the British market.

Why not, Uncle Clive, why not?

John Bloxham
18 Lea Close
Stratford-upon-Avon
Warwickshire CV37 9JS

Robot's revenge!

We at East London Robotics generally have a very high opinion of the content of your news pages, but we just have to point out some minor inaccuracies in your Peek & Poke page (March 3-9 "Giving them a plug").

ELR is not "in the process of moving". The move was completed before Christmas. Demand for our memory expansions and Slowloaders has far outstripped our expectations, but we have now managed to reduce the waiting time for an issue two 32K rampack to less than two weeks. We are expecting to deliver the entire backlog of issue one expansions by April 7, when delivery will be available in 10 days. British Telecom has been rather slow in putting in our extra telephone lines, and it has, indeed, been rather difficult to get through. The situation on this is now dramatically improving.

We would not like your readers to be confused by the brief technical description of a 32K chip set in your magazine's reply. There are more than two decoding chips required, and you fail to mention that issue two spectrums themselves have a number of different variations which can cause complications. East London Robotics is not simply in the business of selling standard chips with a spectacular mark up. We provide a fitting service at our premises or by post, as well as free help if there are any bugs.

Was the "plug" for our competitors simply revenge for our having failed so far to place advertisements in your excellent paper?

Roger Vellacott
East London Robotics
No 11 Gate
Royal Albert Dock
London E16

The "plug" for your competitors was simply a matter of informing one of our readers of an alternative source of supply, since he had been unable to contact you. Your decision on whether or not to advertise is immaterial.

Flawed score . . .

Further to the *Hungry Horace* saga, I am disappointed to report that I have discovered the flaw in the game. My score is now rarely bellow 75,000. Could Psion or Melbourne House recommend a *Poke* or any way of correcting this flaw which has spoiled an otherwise excellent and addictive game?

J S Mellor
8a Camden St
Plymouth
Devon PL4 8NW

Cowboys and Indians

Yes, another letter concerning software libraries. I am writing in my capacity as a partner in a software club. While I agree with some action being taken against 'cowboy' software libraries, I feel that your magazine should not take sides.

Your editorial (*Popular Computing Weekly*, February 17-23) concerning printing advertisements only from libraries with permission of the software houses is unfair. Our club has been ready to launch for months now, but we have been awaiting replies from the software companies concerned.

We have written to most reputable Vic20 software houses but so far have had only two replies, neither of which had any relevance to our original request for permission to use their tapes. This ignorance from the software houses serves only one purpose: "cowboy outfits" to continue while leaving the more scrupulous libraries out in the cold!

S Greaves
24 Alton Road
Aylestone
Leicester LE2 8QA

I do not think our editorial of February 17-23 was unfair. It seems perfectly reasonable to me to ask all software libraries to obtain permission from the software manufacturers whose tapes they hire out.

While this may seem to discriminate in favour of the less scrupulous libraries, who just go about their business without reaching any agreements, in the long run I am sure it will benefit both software libraries and manufacturers. Sooner or later, the "cowboys" will be brought to account for their actions.

Remote control

I am very pleased to see that you now include a special page devoted to the BBC. However, please remember that not all these machines are sold for educational purposes and that there is a growing army of "home users".

I would like to see more articles such as "Walking the Wires" (*Popular Computing Weekly*, 24 February-3 March), which actually makes use of the many and varied input/output devices on the model B.

One problem seems to be finding suitable signal devices to plug in to the A/D port. Where, for example, can I get something to convert a temperature or a pressure to 0-1 8 volts? It would also be useful to have something that could switch mains voltage household appliances or lights on or off by computer control.

D Clapp
The Croft
Haseley Kob
Warwick CV35 7NL

Memory games

I am a Dragon 32 owner who was very unhappy about the way the Dragon 32 *List* worked. The whole program is just *listed* at great speed (auto scrolling) until you have only 14 lines of text left. With a 200 line program that's not a lot of use (unless you have a photographic memory). Playing at the keyboard I found if you type *List and Enter*, the program is then *Listed*. To stop it just type *List* and *Enter* the program, when you want to continue just press any other key.

I hope this information will be of use to your readers who write their own software and have to debug it at the screen.

Ashley Buss
2 Pembroke Place
Caversham
Reading
Berkshire RG4 0HU

Foxbat's conversion

I thought that owners of the 16K Spectrum might like to know how to convert *Foxbat* (Vol 2 No 8) to run on their machines. The following alterations should be made:

```
2 CLEAR 32099 LET SS =
0 LOAD "" CODE
32100
130 POKE 32100 n
190 LET L = USR 32100
```

in program 1, and in program 2

```
10 CLEAR 32099
80 LET A = 32100
190 SAVE "HANG ON" CODE
    32100 120
```

I would also like to congratulate Sinclair Research for the delivery of my Spectrum, 28 days exactly, and to Sunshine Books as I ordered *Cruising* on a Monday, and received it on the Wednesday!

R Wynes
94 The Butts
Frome
Somerset BA11 4AF

April Fool Island

A new game for BBC model B by Nick Wilson

March 31st You retire to bed — impatiently waiting for tomorrow in anticipation of all the tricks you will play on your elder brother You fall asleep happily

April 1st You wake up to the sound of waves crashing nearby! Your brother has beaten you to it He has April-fooled you You read the note that is pinned to the foot of your bed

Dear brother, Ha ha! April fool! I have placed you at one end of this curious island There is a boat on the far side of the island and you must reach it to stand a chance of returning home But beware — you must not stray from the maze of paths You may meet several random obstacles along your way But don't worry instructions are there to help you Perhaps! Good luck — and see you soon, brother

Program notes

The program has several smaller programs held inside These small programs make up the obstacles The main loop moves you

(1) When typing in use the same line numbers

(2) Don't put the data onto one line

(3) Series 1 Roms should change *Peek~227* to *Peek = 129* in line 520

(4) When typing lines 320—430 and 1115—1119 change all *f's* to *Ch$ 225* and all *S's* to *CHR$ 226* This is achieved by using the copy key The change is necessary because the printer used for the printout could not print user-defined graphics so normal letters had to be substituted

```
LIST
   10 MODE1
   20 PROCsetup
   30 PROCmaze
   35 COLOUR1:VDU31,X,Y,226
   36 VDU19,2,4,0,0,0
   37 COLOUR3
   40 PRINTTAB(0,3)"N,S,E ?"
 ;INPUTTAB(7,3)A$
   41 COLOUR2
   50 IF A$<>"N" AND A$<>"S" AND A$<>"E"
VDU7:GOTO40
   55 VDU31,X,Y,225
   60 X=X-(A$="E")
   70 Y=Y+(A$="N")-(A$="S")
   80 PROCcheck
   85 COLOUR3
   90 IF RND(1)>.4 GOTO 35
  100 J=RND(10):IF J=3 AND RND(1)>.5
THEN GOTO 35
  105 GOSUB (900+J*100)
  110 GOTO 30
  200 DEFPROCsetup
  210 X=0:Y=10
  220 VDU23,225,85,170,85,170,85,170,85,170
  230 VDU23,226,24,189,153,126,60,24,36,102
  240 VDU23,227,0,0,32,81,138,2,0,0
  290 ENDPROC
  300 DEFPROCmaze
  301 CLS:COLOUR2:FORF=4 TO 20:PRINTTAB
(0,F)STRING$(39,CHR$(227)):NEXTF
  320PRINTTAB(0,6)"SSSSSIIIIIIII"
  330PRINT"SSSSSISSSISSI
  340PRINT"SSSSSISSSISSI"
  350PRINT"SSSSSISSSISSIIIIII"
  360PRINT"IIIIIIIISISSSSSISIIIIIIIIIIIBOAT"
  370PRINT"SSSSSSSISIIIIIIISSSSI
  380PRINT"SSSSSSSISISSSISSSSSSSI"
  390PRINT"SSSSSSSIIIISSIIIIIIII"
  400PRINT"SSSSSSSISSISSSSSSSSSI
  410PRINT"SSSSSSSIIIIIIIIISSSSI
  420PRINT"SSSSSSSSSSSSSSISSSSI"
  430 PRINT"SSSSSSSSSSSSSSSIIIIII
  440PRINT
  445 COLOUR3
  450ENDPROC
  500 DEFPROCcheck
  510 PROCpeek(X,Y)
  520 IF peek=227 FORF=255 TO 30 STEP-1:
SOUND&11,-15,F,1:SOUND&12,-15,F-10,1:SOU
ND&12,-15,F-20,1:NEXTF:CLS:PRINT''"YOU
FELL INTO THE SEA''":GOTO 900
  530 IF X=27 GOTO 800
  540 VDU31,X,Y,226
  550 ENDPROC
  600 DEFPROCpeek(X1,Y1)
  610 VDU31,X1,Y1
  620 A%=135:peek=((USR&FFF4)AND &FFFF)
DIV &100
  630 ENDPROC
  800 CLS:PRINT''"WELL DONE! YOU HAVE
REACHED YOUR BOAT   YOU ARE NO FOOL!!"
  805 FORG=1TO100:SOUND1,-15,RND(255),1:
FORF=1TO8:VDU19,0,F,0,0,0:NEXTF,G
  810 GOTO 920
  900 FORA%=1TO8000:NEXTA%:CLS
  910 PRINT '"APRIL FOOL ISLAND CLAIMS
YET ANOTHER     FOOL!!"
  920 PRINT'''"PRESS ANY KEY"
  930 *FX15 0
  940 N=GET:RUN
 1000 CLS:PRINT'''"THE HAPPY HIPPO SITS
HERE"
 1010PRINT"HE DOES NOT KNOW HIS NAME"
 1020 PRINT"WATCH CAREFULLY AND QUICKLY"'
 1030 RESTORE (1080+RND(14)):READ N$
 1040 PRINT"PRESS ANY KEY":*FX15 0
 1050 N=GET:CLS:PRINTTAB(RND(30),RND
(20));N$
 1055 TIME=0:REPEAT UNTIL TIME>10:CLS
 1060 INPUT' '"WHAT WAS HIS NAME ?" A$:
IF A$=N$ GOTO 1070
 1065 PRINT''"THAT WAS WRONG! ":PRINTN$;
 CHARGES AND KILLS YOU!":GOTO900
 1070 PRINT'''CORRECT!    PRESS ANY
KEY":*FX 15 0
 1075 N=GET:RETURN
 1080DATA HARRY
 1081DATA NICK
 1082DATA SIMON
 1083DATA PETER
 1084DATA FRED
 1085DATA JACK
 1086DATA HUGO
 1087DATA DAVID
 1088DATA ARTHUR
 1089DATA JOHN
 1090DATA CUTHBERT
 1091DATA PAUL
 1092DATA MIKE
 1093DATA JAN
 1094DATA EDWARD
 1100 CLS:PRINT"T H E   D O O R S !!!"
 1110 PRINT''"BEHIND ONE OF THE
DOORS THERE IS A STARVING LION! CHOOSE
CAREFULLY"
 1111 COLOUR1
 1115 PRINTTAB(0,10)"     III    III    III"
 1116 PRINT"     III    III    III"
 1117 PRINT"     III    I2I    I3I"
 1118 PRINT"     III    III    III"
 1119 PRINT"     III    III    III"
 1120INPUT'"WHICH DOOR SHALL YOU GO
THROUGH ",D%:IF D%<1 OR D%>3 THEN VDU11,
11:GOTO1120
 1125 D=RND(3)
 1130 FORF=4 TO 16 STEP 4:FORG=10TO14:
FORH=1TO200:NEXTH:PRINTTAB(F,G)"   ":IF (D
*5-(3-D))=F-1 AND G=12 PRINTTAB(F-1,G)
"LION!"
 1131 NEXTG,F:PRINT''''
 1132 IF D%=D GOTO 1180
 1140 PRINT"YOU CHOSE CORRECTLY!":PRINT'
"PRESS ANY KEY":*FX15,0
 1150 N=GET:RETURN
 1180 PRINTTAB(0,20)"YOU ARE DEAD!":GOTO
900
 1200 CLS:PRINT"THE CRUSHER!!!"
 1210 PRINT''"ONLY ONE LETTER WILL STOP
IT!!"
 1220 PRINT'"PRESS ANY KEY":*FX 15 0
 1221 N=GET
 1225 CLS
 1226 VDU31,20,16,226
 1227 C=64+RND(26)
 1230 FORF=5TO15
```

Continued on page 11

From page 9

```
1225 COLOUR RND(3)
1240 PRINTTAB(0,F)STRING$(39,CHR$(225))
1245*FX 15 0
1255 N=GET:IF N=127 CLS:PRINT' ''CHEAT"
:SOUND1,-15,0,20:FORG=1TO1000:NEXTG:PRIN
T  PRESS ANY KEY":N=GET:RETURN
1258 IF N 65 OR N>91 GOTO 1245
1260 IF N=C GOTO 1280
1261 NEXTF:PRINTTAB(0,16)STRING$(39,
CHR$(225))
1265 PRINT'' YOU WERE CRUSHED''':GOTO900
1280 CLS:PRINT''''SAVED - YOU WERE LUCKY!"
1290 PRINT '"PRESS ANY KEY":*FX 15 0
1295 N=GET:RETURN
1300 REM
1301 CLS:PRINT' '"BACK TO START''
(Ha  Ha!)'
1310 X=0:Y=10:*FX15 0
1320 PRINT'PRESS ANY KEY':N=GET
1340 RETURN
1400 CLS:PRINT''"THE CHARGING  @'S'
1401 PRINT''YOU MUST AVOID BEING CRUSHED!
1402PRINT'"USE  Z  + 'X' FOR LEFT+RIGHT"
1403PRINT''"PRESS ANY KEY":*FX 15 0
1404 N=GET
1410 Q=20
1415 '&FE00=&10200A
1420 FORF=1TO200
1425 VDU31,Q,10,32:IF F>170 PRINTTAB
(0,31):FORH=1TO50:NEXTH:GOTO1435
1429 COLOUR1
1430 PRINTTAB(RND(30),30)'@         @
1431 COLOUR3
1435 PRINT
1440 Q=Q+INKEY(-98)-INKEY(-67)
1441 Q=Q+(Q=39)-(Q=1)
1445 PROCpeek(Q,10):IFpeek=64 VDU31,Q,
10,42:PRINTTAB(0,0)"YOU WERE CRUSHED'':GO
TO900
1450 VDU31,Q,10,226:FORG=1TO50:NEXTG,F
1465 CLS:PRINT'YOU DID IT ':PRINT''
"PRESS ANY KEY':*FX 15 0
1470 N=GET:CLS:RETURN
1500 CLS:PRINT'''THE DELTA RAYS
1501PRINT'"KEEP STILL AND HOPE!"
1502PRINT''"PRESS ANY KEY":*FX 15 0
1503 N=GET:CLS:VDU31,20,16,226
1510 FORF=1TO5
1512 SOUND0,-15,7,255
1513 GCOL0,RND(3)
1515 MOVE RND(1280),0:DRAWRND(1280),1024:
FORG=200 TO 0 STEP-2:SOUND1,0,G,.5:NEXTG,F
1520 PROCpeek(20,16):IF peek=0 PRINT"YOU
WERE SPIKED'':GOTO900
1530 PRINT'' YOU WERE SAFE'':PRINT"PRESS
ANY KEY":*FX 15 0
1540 N=GET:CLS:RETURN
1600 CLS:PRINT' "T H E  S O U N D
T E S T E R''''''
1610 PRINT "YOU MUST TELL ME WHICH
OF THE TWO NOTES IS THE (HIGHEST) '"
1620 PRINT ''PRESS ANY KEY TO HEAR THE
NOTES'
1625*FX 15 0
1626 N=GET
1630 A=RND(250):SOUND1,-15,A,10:
FORG=1TO3000:NEXTG:C=2:A=A+3:IF RND(1)
 5 C=1:A =A-6
1635 SOUND1,-15,A,10
1636 FORG=1TO1    NEXTG
1640 INPUT''"WAS IT 1 OR 2 "A$
1650 IF VAL(A$) C GOTO 1680
1660 PRINT'''WRONG'   YOU ARE KILLED''
:GOTO900
1680 PRINT'' CORRECT''''' YOU ARE
SAVED''":PRINT ''PRESS ANY KEY''":*FX 15 0
1690 N=GET:RETURN
1700 CLS:PRINT''''TRY TO MEMORISE
THESE NUMBERS":PRINT' 'PRESS ANY
KEY TO GET THEM'':*FX 15 0
1701 N=GET:S$=""
1702 FORF=1TO5:S$=S$+CHR$(RND(9)+48)
:NEXTF
1710 PRINT''S$
1720 TIME=0:REPEAT UNTIL TIME>50
1730 CLS:INPUT '''WHAT WAS THE NUMBER",
A$:IF A$ >S$ GOTO 1760
1740 PRINT'' CORRECT'  :PRINT"PRESS
ANY KEY":*FX 15 0
1750 N=GET:RETURN
1760 PRINT ' "WRONG YOU ARE KILLED''"
:PRINT''S$' WAS THE ANSWER''':GOTO900
1800 CLS:PRINT'''T H E  G R U E S O M E
G A M B L E R '"
1801PRINT'"HE HAS THOUGHT OF TWO NUMBERS
AND YOU   HAVE TO TELL HIM IF THE SECOND
WILL BE  HIGHER OR LOWER THAN THE FIRST'"
1802 Q=RND(100):Q1=RND(100)
1803PRINT''"P.S. The numbers are both
less than 100"
1810 PRINT'Q" IS THE FIRST'"
1815 INPUT''IS THE SECOND GOING TO BE
HIGHER OR     LOWER  (H/L) "H$:H$=LEFT$(H
$,1):IF H$<>"H" AND H$<>"L" GOTO 1815
1816 PRINT'Q1" IS THE SECOND'"
1820 H$=H$+" ":H$=LEFT$(H$,1):IF
H$="H" AND Q1>Q OR H$="L" AND Q>Q1
GOTO1860
1830 PRINT''"YOU WERE WRONG' YOU
DIE'':GOTO900
1860 PRINT''"YOU WERE CORRECT' YOU
WIN'"
1870 PRINT''"PRESS ANY KEY"
:*FX 15 0
1880 N=GET:RETURN
1900 CLS:PRINT"THE MAD M A T H E
M A T I C I O N'''''
1901 PRINT''"YOU WILL HAVE 5  SECONDS
TO ANSWER AN   EASY QUESTION'
1910 PRINT''"PRESS ANY KEY TO BEGIN"
:*FX 15 0
1911 N=GET:Q=RND(100):Q1=RND(100):
Q2=Q1+Q:TIME=0
1912 PRINT''"       THE SUM IS :"
1913 @%=0:PRINT'    ";Q;' + ";Q1;" = ";
1914 INPUTW$:W=VAL(W$):PRINT'"YOU
TOOK "TIME/100' SECONDS"
1915 IF W=Q2 AND TIME<500 GOTO1960
1916 IF W=Q2 PRINT'"YOU GOT IT RIGHT
BUT YOU WERE TOO SLOW":GOTO1950
1920 PRINT"YOU GOT IT WRONG'"
1950 PRINT'"SO YOU ARE KILLED'":GOTO900
1960 PRINT''"CORRECT'":PRINT''"PRESS
ANY KEY":*FX 15 0
1970 N=GET:RETURN
```

Fire, turn and run!

***Keith and Steven Brain** run the gamut of Dragon software from Wizard War to Deadwood*

Hardly a week goes by now without somebody advertising new Dragon software — and a substantial amount of material has become available since our last review in January. This time we have looked at nine packages, ranging in price from £3.95 to £9.95, and all supplied on cassette.

We had no problem *Loading* any of them and we were quite pleased with our first impressions of most of them, although we had to force ouselves to stop playing *Monster Mine* and *Phantom Slayer* and delve deeper into the others! Essentially there were games of skill and games of strategy, so we will consider them in two sections.

First, the games of skill consisting of *Arcade Action* (*Meteor Run* and *Breakout*) from Apex, *Defense* (no, we have not spelt it wrong, this is another American import!) and *Phantom Slayer* from Microdeal, and last but not least *Monster Mine* and *Dragon Golf* from Gem.

Meteor Run and *Breakout* are on the same cassette for £3.95 and, although they were certainly far outstaged by the other games, you must ask yourself what can you expect for that price. If you look at the economics of games costing you soon realise that cheap cassettes are almost bound to be poor value. Our advice in general is to save up your hard-earned pennies for something better.

One touch from a Phantom is fatal!

For those of you who are determined to buy a cheapie, then *Breakout* is one of the 'golden oldies' of TV games where you hit a ball against a wall to knock bricks out. *Meteor Run* merely involves dodging objects coming up the screen at you. If you are a beginner, then these may be of interest, but you do not have to be too brilliant a programmer to write games of this standard (so why are you buying them instead of writing your own?)

The *Defense* and *Phantom Slayer* cassettes are twice the price at £8 each, but are in a different class altogether, being entirely in machine code and of real arcade standard. Both have been converted from high-class transatlantic Tandy Color Computer software (by the 'rehash' experts Microdeal once again). If you think that conversion of machine code programs is straightforward then try it yourself and prepare for a nervous breakdown, as the Dragon and Tandy Color Computer systems are much more different than they may appear at first sight!

Defense is an arcade look-alike played on the high-res screen and requires a joystick. The idea is to destroy the oncoming missiles, repel the flip charges, and halt the fusion bombs to save your outposts from destruction. It features a hi-score table and optional instructions are included in the program. It is a good arcade copy, but our views are a bit jaundiced as we were never that impressed with the original.

Phantom Slayer takes place in a very realistic, full colour, hi-res 3D maze and involves seeking out the dreaded Phantoms before they seek you out! You have a proximity detector, which gives an ominous audible warning of their approach, and a laser pistol. But, be warned that one touch from a Phantom is fatal. As it usually takes more than one shot to kill a Phantom, and your laser pistol takes a few seconds to recharge, we found the best tactic was to fire, turn, and run.

The title sequence is very neat and includes an essential 'demonstration run' through the maze, so you can see what you are up against. Two different maze types are available together with a training mode (thank goodness!) and three speed levels. We found *Phantom Slayer* particularly addictive and great fun! If you are a real masochist, try this one on a black and white TV where you cannot even see the Phantoms!

Without doubt these offerings benefit greatly from the two-year start of US 6809 machine code software for the Tandy Color over the UK efforts in this field.

Monster Mine is another machine code arcade-type game, this time involving travelling upwards from the bowels of a gold mine, collecting cash, and trying to make it to the exit. The only slight problem is that there is a monster on each level which can outrun you! The trick is to run up when the monsters are on the other side of the screen (they said nonchalantly!)

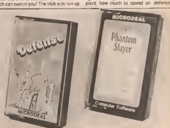
The whole mine is displayed at once in two dimensions and this game moves fast and is much harder than it looks at first. Although we feel the game itself is not quite as testing as the Microdeal offerings, it is more user friendly and includes some very nice humorous touches.

Dragon Golf has some very stiff competition from the offerings of other software houses on the popular golf theme. Although you can pick your club and your "worst vice", many other factors are not included, and in our opinion it is far from the best version available. It only uses low resolution graphics on the text screen and is neither very original nor very close to the real game.

Our favourite golf program is undoubtedly still the Salamander version with its hi-res display of both fairway and green, neat aiming point system, and careful attention to the rules of the actual game. After the fast movement and hi-res display of *Monster Mine* from the same company (Gem), *Dragon Golf* was rather a let-down and it is hard to justify the price of £7.95.

When we had exhausted ourselves on the 'games of skill', we looked at the strategic side and tried to exercise our brains more than our fingers. The games in this section were *Tyrant of Athens* from M C Lothlorien, *Strategic Command* from Romik Software, *Deadwood* from A&F Software and *Wizard War* from Salamander. All used a combination of text-screen and hi-res — both *Strategic Command* and *Wizard War* required two joysticks.

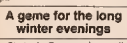
Although *Tyrant of Athens* produces an impressive map of Greece and the surrounding countries, it is rather disappointing in that most of the playing is done on the text screen. It involves a combination of the old 'trading' theme and more warlike activities, as you have to decide whether to fight attacking forces, how much seed to plant, how much to spend on defence,



and how near you dare get to starving your people

It seems that dead wood is not always rotten as the title sequence in the *Deadwood* program gives an impressive display of the old west Although the game itself only involves the low-res screen it can be interesting It is basically a *Monopoly* type program, but not as complicated — do not expect Park Lane and Mayfair standards in this town!

You must deal with the law tend to your supplies and keep in with the bank If you cannot stand any more you can always retire to the casino! The program offers 1-4 player options and you can define the length of game at the beginning in minutes so there is no excuse for staying up all night

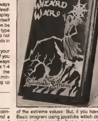


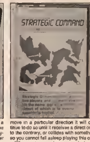
A game for the long winter evenings

The *Strategic Command* cassette contains both the main program itself and a preliminary 'joystick test the purpose of which is unfortunately not made clear in the instructions The idea of a rapid joystick test which will determine if your joysticks will function correctly with the program to be loaded is very good and could save a lot of frustration, so it is a pity that the purpose is not properly explained

Joysticks should always return values of 0 and 63 at the extreme ends of their travel However, with cheap joysticks it is common for the wipers not to reach the end of the potentiometer tracks so that the full range is not seen — which can cause problems when the programmer has not considered this possibility

In practice, it is best to try and avoid use of the extreme values But, if you have a Basic program using joysticks which does not function correctly, first test your joysticks and if the extreme values are never reached then the solution is to *List* the program and alter all the joystick tests to less critical values





But, back to *Strategic Command* itself a complex war game played on a hi-res map which requires you to decide how to build up and deploy your land and sea forces, and then do battle with your opponent, all under joystick control! The rules are explained at length in very small print on the cassette insert and are quite complicated so this is obviously a game for the long winter evenings when everyone else has gone out A nice feature is that once you have given a task force an order to move in a particular direction it will continue to do so until it receives a direct order to the contrary, or collides with something, so you cannot fall asleep playing this one!

When you are close enough to the enemy you can engage in combat, the silhouettes of the appropriate forces are displayed and battle commences, with the computer playing 'umpire and ultimately deciding the outcome Other features are mine laying and air reconnaissance of enemy forces The game is won when (or in our case 'if') you reach the opponent's capital This was the most expensive game at £9 95 and we feel that although it offers good sport (and mind-bending potential) to the war-gaming fanatic and those bored by arcade and adventure games it is too complicated to be easily mastered by youngsters

Wizard War stands out from the others as the most original game in the review even though it seems to be loosely based on the old stone, paper, scissors game You are cast as a wizard engaged in tests of strength against another wizard In each round of the contest, each player must choose from a selection of four different spells randomly drawn by the computer from an armoury of 24

Most of the offensive spells have either partial or full joystick control, and several factors can affect the success of your spell apart from the kind of defence your opponent has put up It even matters what colour the sun is! No wonder a 14-page illustrated 'spell book is included!

Up to nine players can be accommodated but if there are more than three players they are split into three teams with each player taking a turn at representing his group Each team then takes it in turn to battle one of the other teams This game is highly recommended as a more 'social antidote to the loneliness of most arcade games

In conclusion we must say that the general quality of the software was good, and it effectively exploited the potential of the Dragon ■

Firm	Program	Cost	Value (1-10)
Apex 115 Crescent Drive South Brighton BN2 6SB	*Arcade Action*	£3 95	3
Microdeal Deal House Bridges Bodmin Cornwall PL30 5EF	*Defense** *Phantom Slayer*	£6 00 £8 00	8 10
Sam Software 22 Prestwick Drive Bishop's Stortford Hertfordshire CM23	*Monster Mine* *Dragon Golf*	£7 95 £7 95	9 3
M C Lothlorien 4 Granby Road Cheadle Hulme Cheadle Cheshire SK8 6LS	*Tyrant of Athens*	£6 95	6
Romik Software 24 Church Street Slough SL1 1PT	*Strategic Command†*	£9 95	6
A&F Software 830 Hyde Road Manchester	*Deadwood*	£6 90	8
Salamander 17 Norfolk Road Brighton Sussex	*Wizard War†*	£7 95	10

*Requires one joystick
†Requires two joysticks

OPEN FORUM

***Open Forum* is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £6 for each program published.**

Rates

on Spectrum

The local authority rates of which about 75 percent pay for education and the remainder other local services, usually go up by far more than the rate of inflation each year. This program, although written for the Sinclair Spectrum, will run on most microcomputers with minor adaptation.

When you type in the program, enter in the data statements the values appropriate to your house as given by the *Rems*.

When you have entered the program, run it and you will know when the total you have paid in rates will equal what you paid for your house, and in what year your rate bill will equal or first exceed what you paid for your house. (Optionally at this point, complain to your MP.) Save the program on cassette. When you get your rate demand for the next year, add the rate per pound to the data line 80, and run the program again, and save it again on cassette. The prediction will be that much more accurate.

```
  10 BORDER 1: PAPER 1: INK 7:
 CLS
  20 PRINT "Rates"
  30 REM Enter here the rateab
le value of your house.
  40 DATA 219
  50 REM Enter here the first
year you paid rates.
  60 DATA 1977
  62 REM Enter here the cost p
rice of your house
  64 DATA 28500
  70 REM Enter here the rate p
er pound for each year,startin
g with the first. If there is
a revaluation, then scale earl
y years.
  80 DATA 49.69,57.97,73.72,67
.70,99.1,113.1
 100 DATA 0
 200 RESTORE 80
 210 READ RP: LET AVERAGE=0: L
ET ENTRIES=0
 230 READ RP1
 235 IF RP1=0 THEN  GO TO 260
 240 LET ENTRIES=ENTRIES+1: LE
T AVERAGE=AVERAGE+RP1/RP: REM
Average increase
 250 LET RP=RP1: GO TO 230
 260 LET AVERAGE=AVERAGE/ENTRI
ES
 300 PRINT "YEAR","RATES"
 310 RESTORE 60: READ RV: READ
 YEAR: READ PRICE: LET P=1: LE
T TOTAL=0
 320 LET FLAG=0: LET FLAG1=FLA
G: RESTORE 80: FOR N=YEAR TO Y
EAR+49: REM Insert here the nu
mber of years required.
 330 IF FLAG=1 THEN  GO TO 350

 340 LET RPL=RP: READ RP: IF R
P=0 THEN  LET FLAG=1: LET RP=R
PL: GO TO 350
 345 GO TO 360
 350 LET RP=RP*AVERAGE
 360 LET TOTAL=TOTAL+RP*RV/100
: PRINT N, PAPER P;INT (RV*RP/
100)
 362 IF TOTAL>PRICE AND FLAG1=
0 THEN  LET FLAG1=1: PRINT "Th
e total  you have paid so  far
in rates  is more than you  pa
idfor the house."
 364 IF RP*RV/100>PRICE AND P=
1 THEN  LET P=2: PRINT "The an
nual rate bill now exceedswhat
 you paid for your house."
 370 NEXT N: PRINT
```

Rates
by John de Riaz

Art & Circles

on Lynx

It took me some time to work out how to create circles on the Lynx, but the final effect was well worth the trouble. These are good strong circles with glowing colour and they display the colour and graphics of the Lynx with good effect. I prefer the display on a white *Paper* but my son prefers it on *Black*. Either way it looks very good.

In Art we tried to imagine what a modern artist might seek to do. The slight alterations in lines 130 to 150 develop a totally different pattern.

It is well worth experimenting with the basic circle formula — lines 30 to 90 in the Circles program — some of the effects are very good.

```
10 FOR J=0 TO 360 Step 1
20 MOVE 128,127
30 LET X=SIN(RAD(J))
40 LET Y=COS(RAD(J))
50 DRAW 128xX, 127xY
60 INK RAND(6)+1

10 REM "CIRCLES"
20 CLS
30 MOVE 130,200
40 INK 2
50 FOR J=0 TO 180
60 LET X=SIN(J)x75
70 LET Y=COS(J)x75
80 DRAW 120+X, 130+Y
90 NEXT J
100 MOVE 120,175
110 INK 1
120 FOR J=0 TO 180
130 LET X=SIN(J)x50
140 LET Y=COS(J)x50
150 DRAW 130+X, 125+Y
160 NEXT J
170 MOVE 130,180
180 INK 4
190 FOR J=0 TO 120
200 LET X=SIN(J)x25
210 LET Y=COS(J)x25
220 DRAW 120+X, 120+Y
230 MOVE 128,225
240 INK 6
250 FOR J=0 TO 150
260 LET X=SIN(J)x100
270 LET Y=COS(J)x100
280 DRAW 120+X, 120+Y
290 END

10 REM "ART"
20 CLS
30 MOVE 120,200
40 INK 2
50 FOR J=0 TO 180
60 LET X=SIN(J)x75
70 LET Y=COS(J)x75
80 DRAW 128+X, 120+Y
90 NEXT J
100 MOVE 128,120
110 INK 6
120 FOR J=1 TO 180
130 LET X=SIN(J)x100
140 LET Y=COS(J)x75
150 DRAW 120+X, 120+YxPI
160 NEXT J
170 MOVE 75,100
180 INK 1
190 FOR J=0 TO 180
200 LET X=SIN(J)x50
210 LET Y=COS(J)x50
220 DRAW 75+X, 75+Y
230 NEXT J
240 MOVE 150,222
250 INK 4
260 FOR J=0 TO 130
270 LET X=SIN(J)x25
280 LET Y=COS(J)x25
290 DRAW 150+X,200+Y
300 NEXT J
310 END
```

Art and circles
by R White

Pothole

on Spectrum

In this program you, as a potholer, have to manoeuvre yourself down into a cave avoiding the rocks which block your way. The program uses the Spectrum's *Attr* function to find out if you have hit the side of the cave or a rock, and it also uses *Poke* 23692,255 to fool the Spectrum into scrolling.

Program notes

1-60	Sets up graphics
75-84	Prints screen display and scrolls
86-180	Moves man and checks if he has hit anything
1000-1120	Subroutine for when man has hit something
2000-2060	Instructions
9000	Data for graphics

Graphics notes

80	32 inverse spaces, graphic B
84	Graphic A
1090	Inverse ((7 spaces) "YOU'RE DEAD HA HA" (7 spaces)) 32 inverse spaces
2020	Shift 8

```
   1 RESTORE
   2 BORDER 4
   3 CLS
  10 FOR n=0 TO 7
  20 READ a: POKE USR "a"+n,a
  30 NEXT n
  40 FOR n=0 TO 7
  50 READ b: POKE USR "b"+n,b
  60 NEXT n
  65 INPUT "Instructions? (y or n)";a$
  66 IF a$="y" THEN GO TO 2000
  70 LET k=10: LET p=11: LET sc=0
  75 POKE 23692,255
  80 PRINT AT 21,0; INK 3;            ;AT 21,k; BRIGHT 1;            : IF RND>.8 THEN PRINT AT 21,k+(INT (RND*4)+1); BRIGHT 1; INK 0; "B"
  81 PRINT
  82 PRINT AT 0,0;"Score= ";sc
  83 LET sc=sc+1
  84 PRINT AT 10,p; BRIGHT 1; INK 1;"A";AT 9,p;SCREEN$ (9,p)
  86 IF INKEY$<>"5" AND INKEY$<>"8" AND ATTR (11,p)<>56 AND ATTR (11,p)<>123 THEN GO TO 1000
  87 IF INKEY$="5" AND ATTR (11,p-1)<>56 AND ATTR (11,p-1)<>123 THEN GO TO 1000
  88 IF INKEY$="8" AND ATTR (11,p+1)<>56 AND ATTR (11,p+1)<>123 THEN GO TO 1000
 100 LET p=p+(INKEY$="8")-(INKEY$="5")
 110 LET o=INT (RND*3)+1
 120 IF o=1 THEN LET k=k-1
 130 IF o=3 THEN LET k=k+1
 140 IF k<2 THEN LET k=2
 150 IF k>20 THEN LET k=20
 160 GO TO 75
1000 REM hit something
1010 FOR f=1 TO 100
1020 OUT 254,RND*255
1030 NEXT f
1040 FOR f=50 TO -50 STEP -2
1050 BEEP .008,f
1060 NEXT f
1070 CLS
1080 FOR f=0 TO 21 STEP 2
1090 PRINT AT f,0;            ;AT f+1,0;            INK 1;            : NEXT f
1100 INPUT "Score= ";(sc);" Another go (y or n)";a$
1110 IF a$="y" THEN CLS : GO TO 1
1120 STOP
2000 REM instructions
2010 CLS
2020 PRINT AT 0,11;"Pothole";AT 1,11; OVER 1;"_______"
2030 PRINT AT 3,1;"You are a potholer and you must";AT 5,1;"try to manoeuvre your man down";AT 7,1;"inside a deep cave using keys";AT 9,1;"5 for left and 8 for right";AT 11,11;"Good Luck!"
2040 FOR f=1 TO 100
2050 BEEP .08,RND: NEXT f
2060 PAUSE 0: CLS : GO TO 70
9000 DATA 24,90,60,90,24,36,66,0,54,180,130,130,65,130,132,4
9999 SAVE "Pothole" LINE 1
```

Pothole
by A Boyse

Twenty ones

on Dragon

My program is loosely based on pontoon: the idea is to get as close to 21 as possible without exceeding it. On running the program you will be shown six cards face down: two cards will be turned over as you watch, the third card will remain face down. You are then given the option of placing a bet on your cards. After placing a bet you are then asked if you want the third card. The bottom three cards will be played against you. Whichever has the highest score, or if the dealer matches your score, wins.

Program notes

Lines	
10 to 110	Set the variables
120 to 340	Draw the cards face down and the symbols at the bottom of the screen for the *Get* command
356 to 400	Select the six cards checking for duplicates
410 to 290	Puts the symbols according to the card value
290 to 680	Your score
860 to 1810	Takes your fees
1826 to end	Dealer's score and finish

Variables

PT P P1 face card of your score
TV VT V dealer's score
O DD select the card in play
Y,Z card position on the screen
ZZ£ JACK QUEEN KING Draw commands
GG cash in the bank
GT games played

```
10 CLS
20 PRINT @73 "TWENTY ONES"
30 PRINT @136 "BY JOHN JACKAMAN"
40 PRINT @172 "2/3/83"
50 SCREEN 0,1
60 DIM C(11,11):GG = 100:GT = 0
70 IF GG < 1 THEN 1226
80 GT = GT + 1:IF GT > 20 THEN 1250
90 PMODE 1,1:PCLS:D = 1:DD = 0:V = 0
100 VT = 0:P1 = 0:PT = 0:P = 0:TV = 0
110 RESTORE
120 FOR I = 25 TO 225 STEP 75
130 FOR J = 10 TO 90 STEP 80
140 COLOR 7,0
150 LINE(I,J) - (I + 30,J + 70),PSET,BF
160 FOR K = 4 TO 40 STEP 8
170 FOR L = 4 TO 70 STEP 8
180 PSET(I + K,J + L,8)
190 NEXT L,K,J,I
200 LINE(0,170) - (254,170),PSET
210 PAINT(1,1),8,7
220 LINE(0,170) - (254,170),PRESET
230 CIRCLE(31,180),4,8
240 CIRCLE(34,180),4,8
250 CIRCLE(32,183),4,8
260 DRAW"BM30,182;C7U1D1R8U1D1L4U4R1L1C8"
270 CIRCLE(157,180),3,8
280 CIRCLE(120,180),3,8
290 CIRCLE(158,183),3,8
300 CIRCLE(158,178),3,8
310 CIRCLE(219,180),4,7
320 CIRCLE(223,180),4,7
330 CIRCLE(221,178),4,7
340 DRAW"BM216,182;C5R6L3C7D2"
350 CC(1,1) = RND(13):CC(1,2) = RND(4)
360 FOR I = 2 TO 6
370 CC(I,1) = RND(13):CC(I,2) = RND(4)
380 FOR J = 1 TO I - 1
390 IF CC(I,1) = CC(J,1) AND CC(I,2) = CC(J,2) THEN 370
400 NEXT J,I
410 ON CC(D,2) GOSUB 440,450,460,470
420 N = CC(D,1)
430 GOTO 480
440 GET (27,175) - (39,186),C,G:RETURN
450 GET (153,175) - (165,188),C,G:RETURN
460 GET (153,175) - (165,185),C,G:RETURN
470 GET (214,175) - (226,186),C,G:RETURN
480 READ Z,Y
490 SCREEN 1,1
500 PLAY "P6"
510 PAINT(Z,Y),5,0
520 IF N > 9 THEN 660
530 NN = N/2:NN = INT(NN):NN = NN * 2
540 IF NN < > N THEN N = N - 1:GOSUB 520
550 IF N < 1 THEN N = 1
560 ON N GOTO 730,740,710,720,710,
    700,70,660,680,650,620,630,640
570 PUT (Z + 18,Y + 30) - (Z + 30,Y + 40),C,PSET
580 RETURN
590 COLOR 6,5:LINE(Z + 15,Y + 22) - (Z + 15,Y + 51),PSET
600 CIRCLE(Z + 30,Y + 30),9,8,2
610 GOTO 740
620 ZZ£ = "C8R10L5D25G3L5H3U3"
    :GOTO 650
630 ZZ£ = "BF4C8R4F4D20G2NF3NH2
    G2L4H4U20E4":GOTO 650
640 ZZ£ = "C8D25U12E13G13F12"
    :GOTO 650
650 LINE (Z + 18,Y + 22) - (Z + 18,Y + 22),PSET
660 DRAW ZZ£
670 GOTO 740
680 PUT(Z + 18,Y + 30) - (Z + 30,Y + 50),C,PSET
690 PUT(Z + 18,Y + 10) - (Z + 30,Y + 20),C,PSET
700 PUT(Z + 34,Y + 30) - (Z + 48,Y + 40),C,PSET
710 PUT(Z + 2,Y + 30) - (Z + 14,Y + 30),C,PSET
720 PUT(Z + 2,Y + 50) - (Z + 14,Y + 60),C,PSET
730 PUT(Z + 34,Y + 10) - (Z + 48,Y + 20),C,PSET
740 PUT(Z + 34,Y + 50) - (Z + 48,Y + 60),C,PSET
750 PUT(Z + 2,Y + 10) - (Z + 14,Y + 20),C,PSET
760 IF DD > 0 THEN 1036
```

Continued on page 17



ASTROLOGY

truly AVAILABLE AT YOUR FINGERTIPS

USER PROMPTING PROGRAMS. merely key in birth information as requested by the computer — READ OUT (and/or PRINT OUT) what is normally the result of many hours of painstakingly tedious and complex mathematical calculations using tables ephemeris etc.

THE SIDEREAL TIME OF BIRTH
THE ASCENDANT AND MIDHEAVEN in Sign Degrees Minutes and Seconds for EQUAL HOUSE SYSTEM
THE SIGNS AND POSITIONS OF THE HOUSE CUSPS in Sign Degrees and Minutes for the PLACIDEAN SYSTEM
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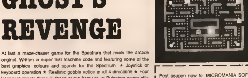
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```
770 P = CC(0 1) IF P > 10 THEN P = 10
780 PT = PT + P
790 IF P = 1 THEN P1 = 10
800 IF PT = 21 THEN 1020
810 IF PT + P1 = 21 AND D = 2 THEN G =
    25 GOTO 1300
820
830 IF PT > 21 THEN 1180
840
850 IF D < 2 THEN D = D + 1 GOTO 410
860 IF D   > 3 THEN 1020
870 DATA 25 10 100 10 175 10 25 60
    100 80 175 60
880 PLAY P1P1 CLS
890 PRINT GAME GT OF 80 GAMES
900 PRINT @ 130 YOU HAVE GG IN THE
    BANK"
910 PRINT
920 PRINT YOUR CARDS TOTAL PT
930 IF P1 = 10 THEN PRINT INCLUDING THE
    ACE PT + P1
940 PRINT STRING$(32 + )
950 PRINT @ 289 YOU'VE SEEN THE CARDS
    HOW MUCH DO YOU WANT TO GAMBLE"
960 PRINT
970 INPUT " G
980 PRINT
990 PRINT  IF YOU WANT THE THIRD CARD
    PRESS T OTHERWISE PRESS THE SPACE
    BAR
1000 Q$ = INKEY$ IF Q$ =      THEN 1000
    1010 IF Q$ = T" THEN D = D + 1 GOTO 410
    ELSE READ Z,Y
1020 IF DD = 0 THEN DD = 1.D = D + 1 GOTO 410
1030 DD = DD + 1 V = CC(0 1)
1040 IF PT + P1 = < 21 THEN PT = PT + P1.P1 =
    0
1050 IF V > 10 THEN V = 10
1060 TV = TV + V
1070 IF V = 1 THEN VT = 10
1080 IF TV + VT = 21 THEN 1140
1090 IF TV = > PT AND TV + < 21 THEN 1100
1100 IF TV + VT < 21 AND TV + VT > PT THEN
    1140
1110 IF TV > 21 THEN 1300
1120 D = D + 1
1130 IF DD > 3 THEN 1200 ELSE GOTO 410
1140 PLAY 'P1P1 CLS PRINT @ 230  YOU LOSE
    GG = GG - G
1150 IF TV + VT = < 21 THEN PRINT TV + VT
    ELSE PRINT TV
1160 PRINT PLAY'S' ,PT
1170 GOTO 70
1180 PLAY P1P1 CLS PRINT @ 230  YOU
    WIN G 2 '£' GG = GG + (G * 2)
1210 GOTO 1270
1230 CLS PRINT @ 235  GAME OVER"
1230 PRINT @ 293  YOU ARE OUT OF MONEY"
1200 GOTO 1270
1230 CLS PRINT @ 230  GAME OVER"
1260 PRINT"YOU WON GG  £"
1270 END
```

Twenty-ones
by John Jackaman

Cat & Mouse

on Vic20

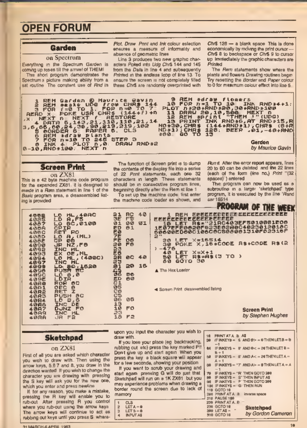
This is a program for the unexpanded Vic

You are a mouse at the left of the maze and the object is to get out of the other side without getting eaten by the hungry cat

The mouse is moved by using Fl F7,Z and C

```
100 P=RND(-TI  PC=0 MC=0 D=0 M=0 T=0 S=0
110 SP=32 SC=96 WC=160
120 IN=197
130 CC=102 C=81
140 TP=7680
150 C$= "                        "
160 DEFFNP(X)=TP+V*44+H*2
180 DIMT(3),M(100)
190 S1=32 S2=32 RS=128
195 HA=9  VM=10
196 GOSUB2000
200 GOSUB1000
210 PRINT"  COUNTDOWN 5", TT=TI D=5
220 IFTI-TT<60THEN220
230 PRINT"  ", IFD=0THEN250
240 D=D-1 POKETP+11,D+48 TT=TI GOTO220
250 PRINTC$
260 T=0 M=0
300 IFTTHENT=0 GOTO360
310 T=1 MC=MC-1 IFMC<0THENMC=3
320 D=PEEK(PC+T(MC))
330 IFD=SPORD=S1ORD=CTHEN360
340 IFMC<3THENMC=MC+1 GOTO320
350 MC=0 GOTO320
360 POKEPC SP PC=PC+T(MC) POKEPC,CC
370 IFP=PCTHEN700
400 FORF=1TO3 GOSUB500 NEXT
410 POKEP SP P=P+M IFPEEK(P)=WCORP=
    SETHENP=P-M M=0
420 IFP=PCTHEN700
430 POKEP C
440 IFP<>HOTHEN300
450 GOTO600
500 D=PEEK(IN)
510 M=0
520 IFD=63THENM=22 RETURN
530 IFD=33THENM=-1 RETURN
540 IFD=34THENM=1 RETURN
550 IFD=39THENM= 22 RETURN
560 RETURN
600 T(0)=1 T(2)=-1 T=0 S=1
610 FORF=0TO29 NEXT POKEP,32
620 IFPEEK(P+T(S))=WCTHEN650
630 IFP+T(S =SETHEN600
640 IFT=3THENZ$=    GOTO900
650 T=T+1 S=S+1 IFS=4THENS=0
660 P=P+T(T) POKEP C GOTO610
700 PRINT"  TAB(HA) "YUM YUM"
710 FORF=0TO300 POKEP C POKEP CC NEXT
720 PRINT" BURP!" GOSUB2100
730 IFAT=1THENFORF=0TO799 NEXT GOTO760
740 FORF=TPTO8163 IFPEEK(F =S1THENPOKEF OP
750 NEXT
900 T=0
910 GETT$ IFT$<>""THEN960
920 IFT=0THENPRINT' "  GOTO940
930 PRINTZ$
940 PRINT"  T=1-T
950 FORF=0TO199 NEXT GOTO910
960 IFT$="N"THENPRINT" " END
970 IFT$=CHR$(13 THENGOSUB2500 GOTO200
980 IFT$="P"THEN190
990 GOTO920
1000 REM DESIGN MAZE
1200 PRINT" " FORF=0TO2*VM
1210 PRINTLEFT$("                    " 2*HM+3) NEXT
1220 H=INT(HM*RND(1)+1) V=INT(VM*RND(1)+1)
1230 P=FNP(X) M=0
1300 POKEP,S2 T=0
1310 IFPEEK(P-44)=WCTHENT(T)=-22 T=T+1
1320 IFPEEK(P-2 =WCTHENT(T)=-1 T=T+1
1330 IFPEEK(P+44)=WCTHENT(T)=22 T=T+1
1340 IFPEEK(P+2)=WCTHENT(T)=1 T=T+1
1350 IFT THEND=T(T*RND(1)) M(M)=P M=M+1
    POKEP+D S1 P=P+2*D GOTO1300
1360 IFT-1THEND=T(0) POKEP+D,S1 P=P+2*D
    GOTO 1300
1400 IFM=0THEN1500
1410 M=M-1 P=M(M)
1420 IFPEEK(P-44)+PEEK(P-2)+PEEK(P+44)
    +PEEK(P+2)=RSTHEN1400
1440 GOTO1300
1500 V=INT(VM*RND(1))+1 H=HM HO=FNP(0)
    +1 POKEHO SS
1510 V=INT(VM*RND(1))+1 H=1 SE=FNP(0)-1
    POKESE SS
1520 P=SE+1 POKEP C
1530 PC=HO-1 POKEPC,CC MC=INT(RND(1))*4
1540 T(0)=1+(RND(1)<.5)*2
1550 T(1)=22 T(3)=-22 T(2)=T(0)*-1
1599 RETURN
2000 POKE36879 250
2001 PRINT"          CAT & MOUSE"
    FORX=1T 1000 NEXT
2002 PRINT"  GUIDE THE MOUSE" PRINT"THROUGH
    THE MAZE" PRINT"BEFORE THE CAT
2003 PRINT"  MOVE THE MOUSE USING -" PRINT"
    F1-UP    F7-DOWN"
2004 PRINT"     Z LEFT  C-RIGHT"
2005 PRINT"     PRESS * TO START"
2006 GETT$ IFT$= "THEN2006
2010 INPUT"    INPUT SPEED(1-5)" S
2020 PRINT"  ORDINARY" PRINT"2.JAILBREAK"
    PRINT"  HAYFEILD
2030 INPUT"    INPUT MAZE TYPE",QQ
2040 IFQQ=1THENS1=SP S2=SP
2050 IFQQ=2THENS1=224 S2=SP
2060 IFQQ=3THENS1=224 S2=224
2070 POKE36879 27 RETURN
2100 FOREE=1TO30
2105 POKE36878 15
2110 POKE36874 111+(EE*4)
2120 POKE36874 0 NEXT
2130 RETURN
```

Cat and Mouse
by Malcolm Forbes



Garden

on Spectrum

Everything in the Spectrum Garden is coming up roses till the arrival of THEM!

This short program demonstrates the Spectrum's picture making ability from a set routine. The constant use of *Rnd* in *Plot*, *Draw*, *Print* and *Ink* colour selection ensures a measure of informality and absence of geometric lines.

Line 3 produces two new graphic characters *Poked* into *Udg Chr$* 144 and 145 from the *Data* in line 4 and subsequently *Printed* in the endless loop of line 13. To ensure the screen is not completely filled these *Chr$* are randomly overprinted with *Chr$* 128 — a blank space. This is done economically by moving the print cursor — *Chr$* 8 to backspace or *Chr$* 9 to cursor up immediately the graphic characters are *Printed*.

The *Rem* statements show where the plants and flowers *Drawing* routines begin. Try resetting the *Border* and *Paper* colour to 0 for maximum colour effect into line 5.

```
   1 REM Garden © Maurice Gavin
   2 REM make UDG from CHR$ 144
   3 FOR f=0 TO 1: FOR n=0 TO 7:
 READ x: POKE USR CHR$ (144+f)+n
,x: NEXT n: NEXT f: RESTORE
   4 DATA 6,143,21,110,110,21,14
3,6,66,60,24,36,90,219,219,102
   5 BORDER 6: PAPER 6: CLS
   6 REM *draw plants
   7 FOR n=10 TO 246 STEP 3
   8 INK 4: PLOT n,0: DRAW RND*2
0-10,RND*100: NEXT n
   9 REM *draw flowers
  10 FOR n=1 TO 10: INK RND*4+1:
 PLOT n*20+RND*20,30+RND*100
  11 DRAW 20,10,500: NEXT n
  12 REM *print "THEM !"(UDG)
  13 PRINT INK RND*6;AT RND*15,R
ND*30;CHR$ (144+RND*1);CHR$ (8+R
ND*1);CHR$ 128: BEEP .01,-40+RND
*60: GO TO 13
```

Garden
by Maurice Gavin

Screen Print

on ZX81

This is a 42 byte machine code program for the expanded ZX81. It is designed to reside in a *Rem* statement in line 1 of the *Basic* program area, a disassembled listing is provided.

The function of Screen print is to dump the contents of the display file into a series of 22 *Print* statements, each one 32 characters in length. These statements should be in consecutive program lines, beginning directly after the Rem at line 1.

To set up the machine code, first enter the machine code loader as shown, and *Run* it. After the error report appears, lines 20 to 60 can be deleted and the 22 lines (each of the form (line no.) *Print* "(32 spaces)") entered.

The program can now be used as a subroutine in a larger 'sketchpad' type program. It is executed by the line '*Rand usr* 16514'.

PROGRAM OF THE WEEK

```
4082  LD HL,40AC      21 AC 40
4085  LD A,F5         3E F5
4087  LD BC,0100      01 00 01
408A  CPIR            ED B1
408C  RET PO          E0
408D  LD A,(HL)       7E
408E  CP 0B           FE 0B
4090  JR NZ,F8        20 F8
4092  INC HL          23
4093  EX DE,HL        EB
4094  LD HL,(400C)    2A 0C 40
4097  INC HL          23
4098  LD BC,1620      01 20 16
409B  PUSH BC         C5
409C  LD B,0          06 00
409E  LDIR            ED B0
40A0  POP BC          C1
40A1  DEC B           05
40A2  RET Z           C8
40A3  PUSH BC         C5
40A4  LD B,6          06 06
40A6  INC DE          13
40A7  DJNZ FD         10 FD
40A9  INC HL          23
40AA  JR F2           18 F2
```

◄ Screen Print disassembled listing

```
   1 REM EEEEEEEEEEEEEEEEEEEEEEEEEEE
EEEEEEEEEEEEEEEEEEEEEE
  10 LET A$="21AC403EF5010001ED0
1E07EFE0B20F823EB2A0C4023012016C
50600EDB0C105C8C50606131DFD2318F
2"
  20 LET X=16514
  30 POKE X,16*CODE A$+CODE A$(2
)-476
  40 LET X=X+1
  50 LET A$=A$(3 TO )
  60 GOTO 30
```

▲ The Hex Loader

Screen Print
by Stephen Hughes

Sketchpad

on ZX81

First of all you are asked which character you wish to draw with. Then using the arrow keys, 5,6,7 and 8, you draw in the direction wanted. If you wish to change the character you are drawing with, pressing the S key will ask you for the new one, which you enter and press newline.

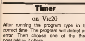
If, for any reason, you make a mistake, pressing the R key will enable you to rub-out. After pressing R you control where you rub-out using the arrow keys. The arrow keys will continue to act as rubbing out keys until you press S whereupon you input the character you wish to draw with.

If you lose your place (eg backtracking, rubbing out etc) press the key marked P!! Don't give up and start again. When you press the key, a black square will appear for a few seconds, showing your position.

If you want to scrub your drawing and start again, pressing G will do just that. Sketchpad will run on a 1K ZX81 but you may experience problems when drawing a border round the screen due to lack of memory.

```
1    CLS
2    LET A=0
3    LET B=0
4    INPUT A$
10   PRINT AT A,B;A$
30   IF INKEY$="5" AND B>=0 THEN LET B=B
     -1
40   IF INKEY$="8" AND B<=30 THEN LET B=
     B+1
50   IF INKEY$="6" AND A<=20 THEN LET A=
     A+1
60   IF INKEY$="7" AND A>=0 THEN LET A=A
     -1
70   IF INKEY$="R" THEN GOTO 300
80   IF INKEY$="S" THEN INPUT A$
90   IF INKEY$="P" THEN GOTO 200
100  IF INKEY$="G" THEN RUN
110  GOTO 10
200  PRINT AT A,B;"  inverse space
210  PAUSE 100
220  PRINT AT A,B;"
230  GOTO 10
300  LET A$=" "
310  GOTO 10
```

Sketchpad
by Gordon Cameron



Timer

on Vic20

After running the program type in the correct time The program will detect any error Then choose one of the three possibilities it offers

* (1) Vic will display the time in hours and minutes Press 'a to get minutes and seconds
* (2) Select the time for the timer and its running!
* (3) Select the time for the alarm to ring At the time you chose you will hear a melody

At any moment you can come back to menu by pressing 'm

Program notes

0-14	Introduction and Menu
15-190	DATAs containing the numbers
191-1000	Time
1000 1200	Alarm
1200	Timer

```
0 PRINT"■ ■■■■■■ TIMER/ALARM CLOCK   "■      CYRIL AUBRY
1 PRINT ■       FRANCE      FORSU=1TO0000 NEXT SU
2 DIM A$(97) FOR Y=0 TO90STEP10 FOR X=1TO 7 READ A$(X+Y) NEXTX,Y PRINT"■"
3 PRINT  WHAT  TIME  IS  IT ?■                          GOTO5
4 PRINT"■■■■■■■■■■ ERROR ■■
5 INPUT ■■        HHMMSS■■■■■■■■■■■",HM$
6 IF LEN(HM$)<>6THEN 4
7 HM=VAL(LEFT$(HM$,2)) IF HM>23THEN4
8 HN=VAL(MID$(HM$,3,2)) IF HN>59THEN4
9 HL=VAL(RIGHT$(HM$,2)) IF HL>59THEN4
10 TI$=HM$ PRINT "■WHAT DO YOU WANT?
11 PRINT PRINT PRINTTAB(4) CLOCK...... .1" PRINTTAB(4)"TIMER.........,2"
12 PRINTTAB(4) ALARM........3" PRINT ■■■■■■■■■■■■■■ TYPE IN THE NUMBER"
13 GET J$ IF J$="  THEN13
14 IF J$<> 1"ANDJ$<>"2"ANDJ$<>"3" THEN13
15 M=VAL(J$)
16 ON M GOTO 191 1200,1000
100 DATA" ■■ ","■ ■ ","■ ■","■ ■","■ ■"," ■ ■ "," ■■ "
110 DATA   ■ " "■■ ","■ ■ "," ■ "," ■ "," ■ "," ■■■
120 DATA  ■■ ","■ ■"," ■ "," ■ "," ■ ","■ "," ■■■■
130 DATA"■■■■ "," ■"," ■"," ■■■"," ■"," ■ "," ■■■■
140 DATA"■  ","■  ", ■  " "■ ■ ","■■■■"," ■ "," ■ "
150 DATA"■■■■","■   ■   "■■■■ "  ■"," ■"," ■■■■"
160 DATA" ■■ ", ■  ,"■  ","■■■ " "■ ■" "■ ■"," ■■ "
170 DATA ■■■   ■ ","  ■ "  ■■■ ,  ■   "  ■ "," ■ "
180 DATA" ■■ "," ■ ■ ","■ ■ "," ■■ ","■ ■ ","■ ■"," ■■ "
190 DATA  ■■  ,"■ ■","■ ■ ", ■■■ ,   ■","  ■ ," ■■
191 PRINT"■",TAB(2) TYPE IN" PRINTTAB(2)"M,,MENU" PRINTTAB(2)"A,,HM/MS"
193 POKE 7910,102 POKE 7998,102 P1=38930 P2=38710 POKEP1,4 POKEP2 4
250 PRINT ■"
400 O=1 P=3 K=4 L=6
490 N=-5
491 GOSUB 1750  T5$=STR$(T5) T6$=STR$(T6) T7$=STR$(T7) GOSUB2010
492 IFTE=1THENPRINT ■■■■■■■■■■■■■■■■■■■■■■■■TIMER  ,T5$TAB(LO+8)T6$TAB(LA+11)T7$ LO=
0 LA=0
493 POKE P1,4 POKE P2,4
494 IF TI-T<60 THEN H=H+(60-TI+T)/.07
495 T=TI
496 FOR X=1 TO H NEXT
497 IF VAL(TI$)>=SO AND AL=1 THEN GOSUB 1100
498 IF INT(TI/60)-T1)=TM AND TE=1 THEN GOSUB1100
499 POKE P1,1 POKE P2,1
500 FOR S=O TO K
505 IFN=5 THEN N=N+2
510 N=N+5 PRINT ■■■■■■■■■■
515 T(S)=VAL(MID$(TI$,S,1))
516 GET A$ IF A$="A" THEN I=O O=P P=1 J=K K=L L=J
518 IF A$="M  THEN 10
520 FOR W=1 TO 7
530 PRINT TAB(N)A$(T(S)*10+W)
540 NEXTW,S
600 GOTO490
1000 PRINT"■" INPUT  HHMMSS (ALARM)   ",SO$ SO=VAL(SO$)
1010 IF VAL(SO$)=0 THEN1000
1020 AL=1 GOTO 191
1100 POKE 36878,15
1110 FOR DU=1 TO 50
1120 POKE36875,200+DU
1122 FOR DE=1 TO 20 NEXT DE
1125 POKE36875,0
1130 FOR F=1 TO DU  NEXT F,DU
1135 IF TE=1 THEN PRINT ■■■■■■■■■■■■■■■■■■■■■■■■■              " TE=0 RETURN
1140 IF AL=1 THEN PRINT ■■■■■■■■■■■■■■■■■■■■■■■■■■■               " AL=0 TE=0 RETURN
1200 INPUT "■TIMER (HHMMSS)  TM$
1250 IF VAL(TM$)=0 THEN 1200
1300 TE=1 T1=INT(TI/60) T4$=TM$ T2=TI
1500 T7=VAL(MID$(T4$,5 2))
1600 T6=VAL(MID$(T4$,3,2))
1700 T5=VAL(MID$(T4$ 1 2)) TM=T5*3600+T6*60+T7 GOTO191
1750 IFT7=0 AND T6=0 ANDT5=0 THEN RETURN
1760 IF T7=0 THEN1850
1770 T3=1 IF INT((TI-T2)/60))2 THEN T3=INT((TI-T2)/60)
1800 T7=T7-T3 T2=TI IF T7>-1THEN RETURN
1850 T7=59
1900 IFT6=0 THEN1950
1900 T6=T6-1 IF T6<>-1THEN RETURN
1950 T6=59
1960 IFT5=0 THEN RETURN
2000 T5=T5-1 RETURN
2010 IF T6<10 THEN LO=1
2020 IF T7<10 THEN LA=1
2030 RETURN
```

Timer
by C Aubry

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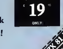
Fig 1

Fig 2

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Meteor

on BBC Micro

This program simulates a game in which you control a trapped space ship in a meteor storm. The ship is out of control and you have only a limited amount of fuel. You can apply reverse thrust to stop it moving forward, rotate it sideways or fire to destroy the meteors. When you hit a meteor or run out of fuel you explode, ending the game.

How many can you hit before you explode? From time to time extra meteors appear and you can be destroyed if they appear on top of your ship.

This program will just fit in a Model A as it stands. This is because instead of using an array to hold the meteors it pokes their position into some spare memory locations. All variables are integer variables for speed and asving of memory.

The program runs in mode 5 making good use of the sound and graphics abilities of the BBC computer.

Variables

A% = used in OSBYTE call
C% = records your horizontal movement
D% = records your vertical movement
E% = character presently representing your ship
F% = fuel
G% = x co-ordinate of missile
H% = y co-ordinate of missile
I% = FOR loop variable
J% = FOR loop variable
P% = pointer to next meteor to be moved
Q% = general purpose variable
R% = general purpose variable
S% = score
X% = your x co-ordinate
Y% = your y co-ordinate

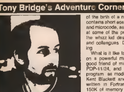
Characters used

225-232	your ship
233	meteor
234	missile
235-238	explosion

```
   10*TV255
   20MODE7:VDU23;8202;0;0;0;:PRINTTAB(10,3)CHR$141CHR$145CHR$157CHR$131
"METEOR STORM  "CHR$156'TAB(10)CHR$141CHR$145CHR$157CHR$131"METEOR STORM
"CHR$156
   30PRINT'''CHR$131"'<'   ROTATE LEFT"''CHR$131"'>'   ROTATE RIGHT"''
CHR$131"'F'   FIRE"''CHR$131"'D'   PREVENT THURST"''''SPC(4)CHR$131"Press
any key to start game"
   40A%=GET:MODE5:PROCA
   50VDU29,X%*64+32;(32-Y%)*32-32+16;:SOUND1,4,200,80:SOUND0,-15,7,160:
FORI%=2TO480:GCOL0,RND(3):DRAWRND(I%)-I%DIV2,RND(I%)-I%DIV2:NEXT:*FX15,1
   60VDU30,10,10:SOUND18,0,0,0:SOUND19,0,0,0:END
   70DEFPROCA:VDU23,225,24,60,126,219,153,24,24,60,23,226,31,7,15,29,249,
112,48,16,23,227,24,12,134,255,255,134,12,24,23,228,16,48,112,249,29,15,7,31,
23,229,60,24,24,153,219,126,60,24,23,230,8,12,14,159,184,240,224,248
   80VDU23,231,24,48,97,255,255,97,48,24,23,232,248,224,240,184,159,14,12,8,
23,233,0,60,66,65,65,66,36,24,23,234,0,0,0,24,24,0,0,0,23,235,129,66,60,60,60,
60,66,129,23,236,56,16,17,159,249,136,8,28
   90VDU19,3,2;0;:S%=0:F%=500:COLOUR2:PRINT'Score:"S%'"Fuel :"F%:X%=10:Y%=15:
E%=225:C%=1:D%=0:COLOUR3:PROCD:VDUE%:FORI%=0TO39
  100Q%=RND(18):R%=RND(26)+3:IFQ%=10ANDR%=15THEN100
  110I%?3328=Q%:I%?3368=R%:I%?3408=RND(3):I%?3448=RND(3):PROCB:NEXT
  120A%=135:P%=0:ENVELOPE1,9,20,20,20,1,1,1,0,0,0,0,100,100:ENVELOPE2,1,41,-2,
-1,5,70,60,24,-1,0,-1,120,90:ENVELOPE3,1,41,-2,-1,5,70,60,1,0,0,-1,5,5:
ENVELOPE4,11,0,-2,-1,10,70,60,1,0,0,-1,50,50
  130SOUND2,1,160,-1:SOUND3,-8,90,-1:FORI%=0TO7:READQ%,R%:I%?3500=Q%:
I%?3510=R%:NEXT
  140DATA1,0,2,0,2,1,2,2,1,2,0,2,0,1,0,0
  150PROCD:IFFNA<>E% ENDPROC
  160IFF%<=0ENDPROC
  170IFINKEY(-104)=0THEN200
  180F%=F%-1:E%=E%+1:IFE%=233 E%=225
  190C%=E%?3275:D%=E%?3285
  200IFINKEY(-103)=0THEN230
  210F%=F%-1:E%=E%-1:IFE%=224 E%=232
  220C%=E%?3275:D%=E%?3285
  230IFINKEY(-51)=-1F%=F%-1:GOTO250
  240PROCD:VDU32:X%=X%+C%-1:Y%=Y%+D%-1:Q%=X%:R%=Y%:PROCC:X%=Q%:Y%=R%
  250PROCD:IFFNA<>32ENDPROC
  260COLOUR3:PROCD:VDUE%
  270IFINKEY(-68)=0THEN350
  280F%=F%-1:G%=X%:H%=Y%:SOUND1,2,10,2:SOUND0,-12,3,2:COLOUR2
  290VDU31,G%+C%-1,H%+D%-1:IFFNA<>32THEN320
  300IFG%<>X% ORH%<>Y% VDU31,G%,H%,32
  310G%=G%+C%-1:H%=H%+D%-1:IFG%>0ANDG%<19ANDH%>3ANDH%<31VDU31,G%,H%,234:
GOTO290ELSE350
  320IFG%<>X% ORH%<>Y% VDU31,G%,H%,32
  330G%=G%+C%-1:H%=H%+D%-1:SOUND0,-15,3,5:SOUND1,3,20,2:FORI%=0TO39:COLOUR1
:VDU31,G%,H%,236:IFI%?3328=G% ANDI%?3368=H% I%?3368=0:S%=S%+10
  340COLOUR2:VDU31,G%,H%,235:NEXT:VDU31,G%,H%,32
  350VDU30:COLOUR2:PRINT"Score: "S%'"Fuel :"F%:FORJ%=1TO8
  360P%=P%+1:IFP%=40 P%=0
  370IFP%?3368=0THEN360
  380Q%=P%?3328:R%=P%?3368:VDU31,Q%,R%,32:Q%=Q%+P%?3408-2:R%=R%+P%?3448-2:
PROCC:COLOUR1:VDU31,Q%,R%,233:P%?3328=Q%:P%?3368=R%:NEXT
  390I%=RND(39):IFI%?3368=0ANDRND(4)=1I%?3368=RND(26)+3:I%?3328=X%:PROCB
  400GOTO150
  410DEFPROCB:SOUND1,-15,RND(255),2:FORJ%=1TO30:COLOUR129:COLOUR2:VDU31,I%?3328,
I%?3368,233:COLOUR128:COLOUR1:VDU31,I%?3328,I%?3368,233:NEXT:ENDPROC
  420DEFPROCC:IFQ%=0ORQ%=20ORR%=3ORR%=31 Q%=21-Q%:R%=35-R%:IFR%=32 R%=30
  430IFQ%=21 Q%=19
  440IFQ%=19ANDR%=31 Q%=18
  450ENDPROC
  460DEFPROCD:VDU31,X%,Y%:ENDPROC
  470DEFFNA=(USR&FFF4 AND&FFFF)DIV256
```

Meteor
by W Hurwood

Tony Bridge's Adventure Corner



Fantasy world!

Adventure is now well-entrenched in the world of microcomputers But nobody really forgets the origins — the legend of the Midnight Programmer slumped over a hot IBM toiling away, after hours in a fantasy world of dungeons and dragons, is well known

Tracy Kidder in his best-selling book *The Soul of a New Machine* includes a fascinating chapter on the beginnings of adventure as played on the old mainframes The book is an absorbing account of the birth of a new microcomputer and contains short essays on Boolean Algebra and microcode, as well as an hilarious look at some of the practical jokes played by the whizz kid designers on their bosses and colleagues Definitely required reading

What is it like to play the original game on a powerful mainframe? Thanks to a good friend of mine I have access to a PDP-11/24, and a copy of the original program as modified for the PDP-11 by Kent Blackett and Roger Coulson It is written in Fortran, and occupies some 150K of memory

The adventure starts in a forest — I am standing at the end of a road before a small brick building A small stream flows out of the building and down a gully Having entered the building, I find a brass lantern, some food, water in a small bottle, and a bunch of keys I don t know if any of these will be of use later in the adventure, so I take them all and go exploring along the stream I come across a two-inch slit in the stream bed but I don t know what to do with it, so I carry on

Stumbling, eventually upon a steel grate I use the keys to unlock it, and find myself in a small chamber beneath the grate I crawl around some dark tunnels, collecting a three-foot black rod and an empty wicker birdcage along the way Going west, I am now confronted by a huge green snake, which refuses to budge

Now it s up to you! Write in to me and tell me what to do next — I will run all the practical suggestions and print the one that seems to be the best solution Then we will continue together and see if we can beat the program I have not gone any further than the Green Snake so this will be a revelation for all of us!

In the meantime keep your suggestions for the PCW adventure coming in and any other thoughts you have on the fascinating world of adventuring

And don t forget — *never ask a werewolf if he has any change* ! ■

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly* Hobhouse Court, 19 Whitcomb Street London WC2 7HF

3D Graph

on BBC Micro

This program will run on the BBC model A or B and demonstrates some of the capabilities of the computer It draws a three dimensional graph of sine between 0 and 180 degrees on one half of the screen while at the same time scrolling the words 'BBC Microcomputer' up the other half of the screen

Program notes

10	Sets the mode
20	Turns off the cursor
30-40	Define foreground colour as magenta and background colour as blue
50	Defines a text screen
60-80	Fills the text window with the words BBC-Microcomputer
90	Loop to draw several sine curves.
100	Move the graphics cursor ready to draw a sine curve
110-130	Draw one sine curve and scroll the text screen by printing BBC-Microcomputer
140-150	Make sounds
160-170	Complete loops
180	End of program

```
10 MODE4
20 VDU23 8202;0;0;0;
30 VDU19 0 4 0 0 0
40 VDU19 1,5 0 0 0
50 VDU28 0 31 16 0
60 FOR A% = 1 TO 33
70 PRINT "BBC-Microcomputer"
80 NEXT
90 FOR B% = 620 TO 1020 STEP 15
100 MOVEB% B% - (B% - 620)/1 6 - 100
110 FOR C% - 0 TO 400 STEP 8
120 PRINT "BBC Microcomputer"
130 DRAWB% + C% B% - (B% - 620)/1 6   100
  - C% + 920 * SIN(C%/128) * SIN((B% -
  620) 128)
140 SOUND1 - 5 (B% - 620) 2 + RND(20) 1
150 SOUND2, - 5 (B% - 620)/2 + RND(20) 1
160 NEXT
170 NEXT
180 END
```

3D Graph
by Nicholas Lloyd

Cruising Challenge

£10 to be won

Can you beat the new high score?

First there was *Space Invaders* then there was *Pacman* — now there is *Cruising* This all action machine code arcade type game will test your powers of co ordination to the limit Never before has a game asked you to think so quickly or move so fast

Achieving a high score on *Cruising* takes considerable skill and not a little practice Getting through the first four levels is not easy and that s just the beginning

Now you can make that skill work for you *Popular Computing Weekly* is offering £10 each month to the player with the highest score on *Cruising* All you have to do to enter this month s competition is send a print out of your highest score together with your name and address to
Popular Computing Weekly
Cruising Challenge
Hobhouse Court
19 Whitcomb Street
London WC2 7HF

Each month we will publish the name of the winner and the new *Cruising* high score Are you good enough to accept the Cruising Challenge?

The highest score sent in so far this month is 9012 from *N Darlow* of Langleigh Road Ilfracombe Devon If you have a higher score you could still win this month s £10 but hurry entries close on March 31

CRUISING on BROADWAY

Notes

1) Each entry must consist of a ... printout and your name and address
2) Closing date for this month s ... Challenge entries is March 31
3) The highest score each month will receive £10
4) High scores cannot be transferred from one month to another
5) The judges decision is final
6) No employees of Sunshine Publications Ltd or their families, will be eligible to enter the *Cruising Challenge*
7) *Cruising (on Broadway)* for the 16K and 48K ZX Spectrum is available through W H Smith and leading computer stores for just £4 95 It is also available mail-order from Sunshine Books Ltd Hobhouse Court 19 Whitcomb Street London WC2 7HF

Bigger and bigger!

Gary Scowcroft presents a program to magnify text on a mode 0 screen

This program allows you to position text of any hieght and width wherever you want on a mode 0 screen

When *Run*, the program asks you to input the word you wish to display Next, you must supply the *x* and *y* co-ordinates of the position where you wish to display the text Finally, you must input the *x* and *y* magnification of the word

If you enter an *x* co-ordinate that is greater than 90, then your chosen word is automatically placed in the centre of the line determined by the *y* co-ordinate This is achieved by setting the vahable *Tab* to −1 (*True*) at line 120, which in turn sets the final parameter in the procedure *Prochar* to *True* in line 150

If you enter 0 when asked for the *x* magnification of a word, the program will calculate the word's maximum magnification and display it centrally on the screen

For speed, the program uses machine code to enlarge the characters This is initialised at line 60 by *Procassemble* The procedure *Prochar* calls the machine code at 340 after storing the appropriate information about the position and magnification of the word This information is stored in zero page locations by *Procmem*

The BBC's character set is stored at C000 Hex in the Rom Each character is made up of eight bytes — the position in Rom of the current character being displayed is calculated in lines 300 310 This information is also stored by *Procmem*

Lines 70 190 just demonstrate the program and can be deleted leaving the three procedures *Prochar*, *Procassemble* and *Procmem* These can be renumbered and then merged (see page 402 of the new user guide) into other programs to produce title pages and other displays Do not forget to initialise the machine code at the beginning of the program before using *Prochar*

```
   10 REM TEXT
   20 REM By Gary Scowcroft
   30 REM (c) 1983
   40 MODE0
   50 VDU 19,0,3;0;0;19,1,4;0;0
   60 PROCASSEMBLE
   70 REPEAT
   80 PROCLEAR
   90 INPUT"Word ,"A$
  100 PROCLEAR
  110 INPUT"TAB ,"X,Y
  120 IF X>90 TAB=-1 ELSE TAB=0
  130 PROCLEAR
  140 INPUT"Mag. ,"x,y
  150 PROCHAR(A$,X,Y,x,y,TAB)
  160 UNTIL FALSE
  170 DEF PROCLEAR
  180 PRINTTAB(0,30)SPC(75);TAB
      (0,30);
  190 ENDPROC
  200 DEF PROCHAR(A$,X,Y,x,y,
      Autotab)
  210 LOCAL B%,C%
  220 B%=LEN(A$)*x
  230 IF x<=0 OR B%>79 x=80 DIV LEN
      (A$):Autotab=-1
  240 IF y<=0 OR y>31 y=1
  250 IF Autotab X=(79-LEN(A$)*x)
      DIV2
  260 IF y+Y>31 Y=32-y
  270 B%=X*8+Y*640+&3000
  280 PROCMEM(&72,B%)
  290 FOR A%=1 TO LEN(A$)
  300 E%=ASC(MID$(A$,A%,1))-32
  310 C%=&C000+E%*8
  320 PROCMEM(&70,C%)
  330 ?&74=x:?&79=y
  340 CALL CHAR
  350 B%=?&72+256*?&73
  360 B%=B%-640*?&79+8*?&74
  370 PROCMEM(&72,B%)
  380 NEXT
  390 ENDPROC
  400 DEF PROCMEM(AD%,NUM%)
  410 ?AD%=NUM% MOD 256
  420 AD%?1=NUM% DIV 256
  430 ENDPROC
  440 DEF PROCASSEMBLE
  450 DIM D% 176
  460 FOR PASS=0 TO 2 STEF 2
  470 P%=D%
  480 COPT PASS
  490.CHAR:LDY£0:STY&7A:STY&7B
  500.L5:TYA:PHA:LDX£0
  510.L3:PLA:TAY:LDA(&70),Y:STA&77
  520 TYA:PHA:TXA:PHA:JSR XMAG:LDX£
  530.L4:SEC:LDA&72:SEC£8:STA&72:
      LDA&73
  540 SBC£0:STA&73:INX:CPX&74:BNE L4
  550 INC&7A:LDA£8:CMP&7A:BNE NNL
  560 LDA£0:STA&7A:CLC:LDA£120:ADC&
      72
  570 STA&72:LDA£2:ADC&73:STA&73
  580.NNL:CLC:LDA£1:ADC&72:STA&72
  590 LDA£0:ADC&73:STA&73:PLA:TAX
  600 INX:CPX&79:BNE L3
  610 PLA:TAY:INY
  620 INC&7B:LDA£8:CMF&7B:BNE L5
  630 RTS
  640.XMAG:LDY£0:STY&78
  650.L2:TYA:PHA:ASL&77:BCC CLE
  660 LDX£1:JSR SETBIT:JMP NEX
  670.CLE:LDX£0:JSR SETBIT
  680.NEX:PLA:TAY:INY:CPY£8:BNE L2
  690 RTS
  700.SETBIT:STX&76:LDX£0:LDY£0
  710.L1:LDA(&72),Y:STA&75:ASL&75:
      CLC
  720 LDA&76:ADC&75:STA(&72),Y
  730 INC&78:LDA£8:CMP&78:BNE NNC
  740 CLC:ADC&72:STA&72
  750 LDA£0:STA&78:ADC&73:STA&73
  760.MNC:INX:CPX&74:BNE L1
  770 RTS
  780 ]:NEXT
  790 ENDPROC
```

A Gift From The Gods . . .

***Jason Orbaum** explains how the Lynx can handle one-dimension string arrays*

It may come as a surprise to some people to know that the Lynx comes with the capability for only single dimension numeric arrays. But, with a little thought these are just as good if not better than 2-D arrays.

I had always assumed that to find the amount of memory taken up by the array *X(A B)* all that must be done is to find *AB (or A*B)* This is not so The array *X(A B)* takes up considerably more space than the array *X(AB* (or *X(A*B))* It is therefore a good technique to use the 1-D array as it saves memory But what happens when you wish to reach array element *(X,Y)* in my 2-D array and realise that you only have a 1-D array?

At the beginning of a program when you wish to *Dim* the array *A(23 14)* you *Dim* the array *A(322)* – *(322* being *23* 14)* If you are lazy the line reads *Dim A(23*14)*

Having done this you proceed as normal with the program until you reach the line *IF A(X,Y)=76 Then Gosub 6573* You might have noticed that it is very difficult to find the element *(X Y)* in the array *A(322)* On reaching this line something along the lines of *'Array Error 1062 At Line 438'* is printed up Just change the line to "*If A(X+Y*14)=76 Then Gosub 6573*" (I would also recommend that a renumbering routine if available is utilised about now) The problem is solved

Now for the next bit of bad news The Lynx cannot handle string arrays of any sort

Let us assume that you wish to *Dim* the array *X$(5 10)* in which no string will be more than 20 characters long The array required is *X(5*10*20)* Once again we are multiplying to achieve the required array, but my computer will not let me hold characters in numeric arrays

To *Load* the array *X$(2,8)* with "Help I'm stuck!" the line would read "*Let X$(2 8)="Help I'm stuck!*" To *Load* the numeric array is a lot more complex and uses the subroutine shown as program one To use it *Z$* must be *Loaded* with the string to be stored. *X* must be *Loaded* with the *X* location in the array and *Y* must be *Loaded* with the *Y* position in the array The program assumes that *ASC(A$)* returns the code for the character in *A$*

Program 1 (To be used as a subroutine)

```
FOR N=1 TO LEN(Z$)
A$=MID$(Z$ N,1)
A=ASC(A$)
X(Y 100+X*20+N)=A
NEXT N
RETURN
```

This program works on the previously defined array *X(5*10*20)*

Once we have *Loaded* the array, we must extract information from selected areas To do this we use a similar routine to the last one On the *Gosub*, *X* must be *Loaded* with the *X-co-ordinate* and *Y* must be loaded with the *Y-co-ordinate* The extracted string will be returned in the variable *Z$*

Program 2 (To be used as a subroutine with program 1)

```
Z$=""
FOR N=1 TO 20
A=X(Y*100+X*20+N)
A$=CHR$(A)
Z$=Z$+A$
NEXT N
RETURN
```

In program one line one simply sets up a loop that goes round once for each character in *Z$* The next line takes a character from the string For those who do not know how *Mid$* works, the first parameter is the name of the variable to be worked on The second parameter is the number of characters down the string that must be counted so in the string "Hello" if the second parameter of the *Mid$* is three it will count along the string to the first *'L'* The third parameter tells the computer how many characters from the string to take

Let us analyse one example If *Z$* is *Loaded* with "Zebras are great!" then *Mid$(Z$,8,3)* will give "*Are*" as its answer The *Mid$* is telling the computer to count eight characters along *Z$* and return the character and the two to the right of it. If you still are not clear about *Z$* consult your manual ZX81 owners will have to replace this line with their own equivalent string splicer

The next line in program one converts the collected character into its Ascii/character code ZX owners need to change this to *A=Code (A$)* This line converts a character that cannot be stored in the array into a number that can be stored

The fourth line stores the character The loop is repeated and control is returned to the main program

The two lines *A$=Mid$* and *A=Asc(A$)* can be replaced with *A=Asc(Mid$(Z$,N,1))* which although it saves memory is much more difficult to explain!

The first line in the extraction routine clears *Z$* try missing it out and unless you are very clever you will find the program will not give the desired effects *Z$* will always be returned with a string 20 characters in length This can then be spliced about as desired (unfortunately if *Chr$(0)* is not a space on your particular machine, then a loop will have to be introduced at the beginning of the program to fill the array with the number of the space character)

Each time the program goes through the loop, it takes the number from the array, converts it into a character and adds that character to *Z$* On finishing the loop control is returned to the main program The *A=* and *A$=* can be replaced with *A=Chr$(X(Y* 100+X* 20+N))*

So far we have seen for the array *X$(A B)*, where no string will be more than C characters long, the array becomes *X(A * B * C)* The fourth line in program one is *X(Y * (A * C) + X * C + N)=A*. The third line in program two is *A=X(Y * (A * C) + X * C + N)*

If you are writing a program in which speed is very important, then it will be futile to use this method as it takes a lot longer But if memory is drawing thin, and you are not totally speed dependent, then it could be very useful And to any Lynx owner, it could well be a gift from the gods ■



Musical chairs . . .

***John Durst** presents two m/c programs which enable you to create your own sound effects*

Sound effects can do a lot to make a program more interesting. Judicious use of the *Beep* command can produce a range of sounds from a click to a musical phrase.

By using variations of the *For/Next* loop, you can get an impressive selection of burps and twitters. But, you cannot produce a smoothly changing note, nor can you make a note throb — unless you dive into machine code.

Luckily if you do decide to dive in, you will not find yourself in very deep water. Here are two short machine code programs which anyone should be able to write — and which go a good way to extend the range of sounds on offer to the Spectrum user.

The sounds in these programs are generated directly through the machine code instructions. To understand how the programs do this, we need to know a bit about how the Spectrum sets about generating a sound in the first place.

The Spectrum does its *Beeping* in a very simple way. The internal speaker is connected to one of the output ports of the Z80 processor (see page 80 of the Spectrum manual). When the speaker bit (D4) is set, it activates the circuit and a click is produced at the speaker. By arranging that D4 switches on and off some hundreds of times a second, the ear interprets the clicks as a sound of a definite pitch.

Clearly, with this system there can be no way, without extra hardware, to modify the waveform and so change the characteristics or the volume of sound. However, there is one thing we can play with and that is pitch: we can (and *do* whenever we set up new values for *Beep*) alter the rate of clicks and so change the frequency of the note.

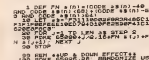
The processor controls the rate of clicks by counting up to 100 or so and then outputting a click. Since it counts in terms of micro seconds it gets to 100 in much less than a hundredth of a second so it will be producing a note well within the audible range.

Now suppose we arrange to alter the target figure which the processor has to count to, eg if we decrease the number by one, every few times round, what happens? We get a note which changes pitch continuously — which swoops up or down, like a *Swannee Whistle*.

Figure 1 shows a short Basic program which allows you to enter machine code in the Ram. You should reserve a space by altering Ramtop first, of course. I have addressed it to 65001, but you can choose any address you like.

Alongside the listing, you will see a number of addresses which you can *Poke* with different numbers to give different effects. You will find you can get an amazing selection — from a "*Zip!*", like a ricochet to a long howl. Naturally, if you alter the start address you will have to alter the other addresses pro rata.

Figure 2 shows the machine code listing. There are a couple of interesting



```
SWANNEE WHISTLE (Basic Program)

   1 DEF FN a(n)=(CODE a$(n)-48
AND CODE a$(n)<65)+(CODE a$(n)-5
9 AND CODE a$(n)>64)
  10 LET a$="F31110D0260A3A485C1
F1F1F0EFEEE10ED70431OFE2520F41C1
520E8FBC9"
  20 FOR j=1 TO LEN a$ STEP 2
  30 POKE 65000+j/2,16*FN a(j)+F
N a(j+1): NEXT j
  90 STOP

  99 REM **UP & DOWN EFFECT**
 100 POKE 65026,28: RANDOMIZE US
R 65001: POKE 65026,29: RANDOMIZ
E USR 65001: GO TO 100
```

Figure 1

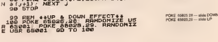
FDE9 (Hex) = 65001 (Decimal)

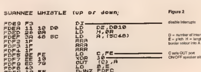
POKE 65003 pitch

POKE 65004 span of slide

POKE 65006 total duration of slide

POKE 65025 28 — slide DOWN
POKE 65025,29 — slide UP





```
SWANNEE WHISTLE (up or down)

FDE9 F3          DI
FDEA 11 10 D0    LD    DE,D010
FDED 26 0A       LD    H,0A
FDEF 3A 48 5C    LD    A,(5C48)
FDF2 1F          RRA
FDF3 1F          RRA
FDF4 1F          RRA
FDF5 0E FE       LD    C,FE
FDF7 EE 10       XOR   10
FDF9 ED 79       OUT   (C),A
FDFB 43          LD    B,E
FDFC 10 FE       DJNZ  FDFC
FDFE 25          DEC   H
FDFF 20 F4       JR    NZ,FDF5
FE01 1C          INC   E
FE02 15          DEC   D
FE03 20 E8       JR    NZ,FDED
FE05 FB          EI
FE06 C9          RET
```

Figure 2

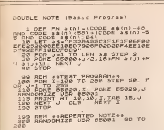
disable interrupts

D = number of intervals = span of slide
E = pitch H = length of interval = total duration
border colour into A

C sets OUT port
ON/OFF speaker bit

INC E = DOWN sweep DEC E = UP sweep

enable interrupts



```
DOUBLE NOTE (Basic Program)

   1 DEF FN a(n)=(CODE a$(n)-48
AND CODE a$(n)<58)+(CODE a$(n)-5
5 AND CODE a$(n)>64)
  10 LET a$="F33A485C1F1F1F06F00
EFE252006EE10ED7926F02D20F4EE10E
D792EFF10ECFBC9"
  20 FOR J=1 TO LEN a$ STEP 2
  30 POKE 65000+J/2,16*FN a(J)+F
N a(J+1): NEXT J
  90 STOP

  99 REM **TEST PROGRAM**
 100 FOR I=100 TO 250 STEP 50: F
OR J=1 TO 255
 110 POKE 65020,I: POKE 65029,J:
 RANDOMIZE USR 65001
 115 PRINT AT 10,10;I;TAB 15;J
 120 NEXT J: CLS : NEXT I
 190 STOP

 199 REM **REPEATED NOTE**
 200 RANDOMIZE USR 65001: GO TO
200
```

Figure 3

FDE9 (Hex) — 65001 (Decimal)

POKE 65005 duration of note (B)

POKE 65020 note 1 (H)

POKE 65029 note 2 (L)

```
DOUBLE NOTE

FDE9 F3          DI
FDEA 3A 48 5C    LD    A,(5C48)
FDED 1F          RRA
FDEE 1F          RRA
FDEF 1F          RRA
FDF0 06 F0       LD    B,F0
FDF2 0E FE       LD    C,FE
FDF4 25          DEC   H
FDF5 20 06       JR     NZ,FDFD
FDF7 EE 10       XOR   10
FDF9 ED 79       OUT   (C),A
FDFB 26 F0       LD    H,F0
FDFD 2D          DEC   L
FDFE 20 F4       JR     NZ,FDF4
FE00 EE 10       XOR   10
FE02 ED 79       OUT   (C),A
FE04 2E FF       LD    L,FF
FE06 10 EC       DJNZ  FDF4
FE08 FB          EI
FE09 C9          RET
```

Figure 4



disable interrupts

border colour into A
B — duration of note C sets OUT port

ON/OFF speaker bit
H — Note 1 pitch

ON/OFF speaker bit
L — Note 2 pitch

enable interrupts

points to note — in the first place output port No 254 sets the *Border* colour as well as driving the speaker (see page 160 of the Spectrum manual) So to preserve this colour we collect it from the system variables at 23624 (5C48 Hex) in line *FDEF* and then push the bits into the positions we require in the next three instructions

Line FDF7 switches the speaker on and off When you *XOR* a binary number with another unmatched bits stay as "*1*" but all matching pairs of bits are changed to "*0*" So as the program cycles through the bit at position 4 (the "*1*" of "*XOR 10*") will find itself opposite a "*0*" which it will change to "*1*" Next time round, it will find itself opposite this same "*1*" — so it promptly changes it back to "*0*" These alternating "*1*" and "*0*" signals switch the speaker on and off

Finally the first instruction "*DI*" — Disable Interrupts — stops the normally continuous process of scanning the keyboard every 1/50th of a second If you do not do this the Interrupts superimpose a 50Hz hum on your program and spoil the quality of the sounds you generate But you must remember to include *EI* — Enable Interrupts — at the end of the program!

The second sound effect program outputs two different notes at once I had hoped when I planned the program that it would play a chord but it does not work quite like that Presumably to sound a chord you have to superimpose two separate complete waveforms rather than two sets of on/off signals at different frequencies However the program produces some interesting beat effects ranging from a sort of rasping twitter to quite a bell like clang

As before Figures 3 and 4 give the listings I have again placed the machine code at 65001, but you can redirect it to a different address if required

The program uses the same system to generate the sound as before But this time there are two sets of counters one for note 1 and the other for note 2 It counts down one at a time on each of them alternately When one of them reaches zero it outputs to the speaker before starting a new round

The number at address 65009 (*FDF1* Hex) controls the number of times the entire program cycles through before stopping ie the duration of the note Since only the "*B*" register is used to hold the number the biggest number it can deal with is 256 If you try to *Poke* anything bigger you will get a dusty answer The actual length of the note also depends on the pitch — it will be longer for a deep note than it will be for a high note

The little program at line 100 of the Basic listing will run through a representative selection of note pairs They vary quite a lot, but the most effective pairs seem to be notes that are almost identical ■

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After selecting one of the two colour sets, the user can move a coloured line around the screen merely by pressing the four arrowed keys Although this may be enough for very young children, there are additional commands to improve the sophistication of the drawing These are the one key commands

- C Alter the COLOUR of the drawing line. After the C press one of the number keys 1 — 4 remembering that 1 is the code for background colour and so is invisible It can be used to erase lines. The program automatically adjusts for whichever colour set has been selected
- B BLANK the screen for a restart.
- P PAUSE the drawing line until another arrow key is pressed
- S Alter the SPEED of the drawing line between 0 (slow) and 9 (fast) The program begins with a medium speed
- R RESET the colour of drawing line at background value for erasing To start drawing lines again the colour code needs to be changed
- M MOVE the drawing point to another part of the screen This assumes the screen has width (0—255 horizontal) and height (0—191 vertical) The 0 0 point is the top left-hand corner Try the command after you have mastered the others.
- E END the program

Full instructions are available within the program Happy doodling!

```
      ****************************
[illegible] ***       D O O D L E        ***
30    ***           B Y              ***
40    ***        P YEANDLE           ***
50    ***          POOLE             ***
60    ****************************
70
80 PRINT "DO YOU WANT INSTRUCTIONS - Y/N [illegible]
90 A$=INKEY$:IF A$="" THEN 90
100 IF A$= [illegible] THEN [illegible]
110 L=1[illegible]
120 INPUT "COLOUR SET - [illegible] OF 1 [illegible] IF [illegible]
130 PMODE [illegible] 1:SCREEN 1,[illegible]
140 M(1 =[illegible]5 [illegible] =191
150 D$= [illegible] DRAW [illegible]
160 A$=INKEY$:IF A$="" THEN 150
170 IF A$=CHR$( [illegible] THEN D$="LI [illegible] =L
180 IF A$=CHR$( [illegible] THEN D$="RI [illegible] =L
190 IF A$=CHR$(10 THEN D$="DI [illegible] =L
200 IF A$=CHR$(94 THEN D$="UI [illegible] =L
210 IF A$= [illegible] THEN 4[illegible]
220 IF A$="B" THEN 150
230 IF A$="P" THEN D$= [illegible] =0
240 IF A$="E" THEN END
250 IF A$="R" THEN D$= [illegible] =0
260 IF A$="M" THEN 35[illegible]
270 IF A$ [illegible] THEN [illegible]
280 A$=INKEY$:IF A$="" THEN [illegible]
290 IF A$ [illegible] OR A$ [illegible] THEN [illegible]
300 L=[illegible] A$ -4[illegible]3
310 [illegible]=L
320 FOR I=0 TO [illegible]:NEXT I
330 DRAW D$
340 GOTO 160
350 D$="B'":[illegible]$=""
360 FOR K=1 TO [illegible]
370 [illegible]$=""
380 B$=INKEY$:IF B$="" THEN [illegible]30
390 IF B$=CHR$(1[illegible] THEN 4[illegible]
400 IF B$[illegible] OR B$ [illegible] THEN [illegible]
410 [illegible]$+B$:GOTO 350
420 [illegible]$=RIGHT$("000"+[illegible]$,[illegible]
430 IF [illegible] THEN [illegible]$=RIGHT$([illegible]$,[illegible]
440 D$=D$+[illegible]$
450 IF K=1 THEN D$=D$+[illegible]
460 NEXT K
470 GOTO [illegible]0
480 B$=INKEY$:IF B$="" THEN 4[illegible]0
490 IF B$ [illegible] OR B$ [illegible] 4 THEN 4[illegible]0
500 D$= [illegible] CHR$( [illegible] B$ +[illegible]4
510 GOTO 250
520
530   ***     INSTRUCTIONS     ***
540
```

Continued on page 37

from page 35

```
550 CLS 8
560 PRINT
570 PRINT@ 64 "THIS IS A DRAWING PROGRAM USING SIMPLE      COMMANDS
580 PRINT@ 96 "TO DRAW HORIZONTAL OR VERTICAL LINES        THE
    APPROPRIATE"
585 PRINT@ 224,"ARROWED KEY."
5   PRINT@ 288 "YOU MAY ADJUST THE SPEED                  TIME BY
    PRESSING #
595 PRINT@ 352      FOLLOWED BY ANY KEY 0 - 9"
600 PRINT        0  SLOW    9  FAST
610 GOSUB 800
620 CLS
630 PRINT@64  C  COLOUR CHANGE PRESS A NUMBER    1-4 AFTER IT. NOTE THAT
    1 IS
640 PRINT@128      THE SAME AS THE BACKGROUND"
650 PRINT@192 'P  PAUSE'
660 PRINT@256  R  RESET - CHANGE COLOUR TO        BACKGROUND TO ENABLE"
665 PRINT@320      LINES TO BE ERASED.
670 PRINT@384  E  END PROGRAM RUN.
680 GOSUB 800
690 CLS 6
700 PRINT  M  MOVE DRAWING POINT.i.e. NEW      START POSITION AS FOLLOWS -"
705 PRINT@64       HORIZONTAL  0   255          VERTICAL  0 - 191)
710 PRINT  PRESS ##### AFTER EACH
720 PRINT@192  C COLOUR CHANGE. FOLLOW THI.      WITH NEW COLOUR CODE
730 PRINT@256  ###### ### 0        ###### ### 1
    PRINT    GREEN        .         BUFF"
750 PRINT    YELLOW       -         CYAN
760 PRINT    BLUE         -         MAGENTA '
770 PRINT    RED          +         ORANGE'
780 GOSUB 800
790 GOTO 110
800 PRINT@448    PRE  ##### ### T. CONTINUE
810 A$=INKEY$ IF A$=   THEN 810
820 IF A$.       THEN 810
    RETURN
```



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VIC20, C2N cassette deck part 1 + 2 prog ref guide 8K Ram 2 games, 1 maths 2 swap for Spectrum 48K. Tel 01-858 2623

VIC20 + **CASSETTE UNIT 3K** extra Ram intro to Basic 1 Vic Revealed manual £140 Tel 01 205 8406

COMMODORE 4032, 12in screen version 4 Basic with cassette deck £456 ono Tel 0800 4443 (after 6pm)

Acorns for sale

ACORN ATOM, 12K + 12K, 6522 chip joystick colour board 20 games £230 Tel 01-458 3383

BBC MODEL B 30 reel cost + other books plus leads software £800 as new Tel 01-530 2864 (any time)

ACORN ATOM, 16K + 12K Ram, floating point + m/c monitor/disassembler in Ram 300/2400 cass tape interface 3 amp PS + s/w £128 ono Tel 061 775 0205

ACORN ATOM, 12K Ram 12K Rom as seen manual vgc lots of Arcade s/w, £120 ono Tel Billericay 61780

ACORN ATOM 12K Ram 16K Rom, PS uv/la tapes + listings £180 Tel Oxted 4815

Ataris for sale

ATARI 400, 48K 2 months old manuals Basic cartridge programme recorder £110 software Atari joystick, Arcade type track ball controller £370 Tel 0906 890216

ATARI VCS, excellent condition, 7 cartridges Space Invaders Missile Command Star Raiders, worth £280 accept £200 Tel Guildford 38580 (evenings)

ATARI US — swap for ZX81 16K + cassette recorder Tel Skelmersdale 28209

ATARI 800 + cassette recorder 2 joysticks £40 Books + software swap for BBC model B Tel 0253 57148

ATARI VCS, 7 cartridges including Asteroids Basic programming £128 Tel 01 394 0458

ATARI 400, 48K, guaranteed recorder Basic all manuals + books £130 software inc joysticks LE stick original box. £375 only Tel 0702 559455 after 5 pm

ATARI VCS + 12 cartridges including Star Voyager Laser Blast Superman £200 ono Tel Newport Salop 812388

ATARI 800 system 48K disc drive etc, 100 discs, packed with software New worth £3 500 4 months old Highest offer takes away Tel Warrick 496808

ATARI VCS plus 5 cartridges including Space Invaders Missile Command offers around £120 or will swap for a ZX Spectrum. Tel Odiham 3445 after 6 pm

ATARI VIDEO CONSUL with 4 cartridges, Combat, Golf Space Invaders and Chess, £85 ono Tel 0742 863152 (anytime)

ATARI VCS, very good condition plus 4 cartridges £90 Other cartridges for deal at £10 and £15 Tel 0293 88705

Tandys for sale

TRS 80 pocket computer with printer + charger case accessories £100 Tel 01-620 8664 (any time)

TRS 80 Model 3, two central disc drives tape deck, all manuals leads, much software on disc + cassette £1 800 new November Tel 01 572 2917

TRS 80 Model 1 level II 16K, cassette deck, progs on cassette all manuals + Mags inc £175 ono Tel 01 572 2917

TRS80 16K, expansion interface £150 ono Tel Biggin Hill 71740

16K VIDEO GENIE, sound board printer interface over £200 software inc word processing assembler basic compiler £250 ono Tel 01-586 2925

For sale

KANSAS + Commodore software games + programs Tel 01-471 7040

SWAP Mansion Adventure for Dragon 32 for any other game inc Star Raiders Tel 021 707 6085 weekends only

POP COMP WEEKLY Nos Vol 1 Nos. 1-36 Vol 2 No 1 10 Tel Luton 30170 (evenings — Peter)

G7000 including 3 cassettes 3 months old £70 or swap for Spectrum with laser difference Tel 01-876 4628 after 5 pm.

SWAP OR SELL 30K Spectrum programs including The Hobbit Cruising Centipede etc Tel (0602) 264851 evenings Richard

VIC20 cartridges to swap for my cassette software Tel Karim 01-387 8751 8 to 10 pm

SWAP Crazy Shoot-out cartridge for any other Atari or Thorn EMI cartridge Tel 01 867 8874 after 4 30 pm

SOFTWARE cassettes for Vic20 Offers (10) Tel Reading 665458

SWAP TCR for any Spectrum software Tel Walton 832004

VIC20 cartridges for sale most at half price Tel Stevenage (0438) 811634 (6 pm)

TEXAS TI 99 three months old cassette interface cable new software cartridges, cassette software + cassette recorder + manuals, £200 Tel 061-306 2350

SWAP JAWBREAKER + £10 for Thorn EMI Submarine Commander or Soccer Tel 01-687 8874

PIRATE COVE for Adventure Land Tel Abson 2477 after 6 pm

Z80 SAUCERERS 48K, Basic Rompac Offers Tel 0964 297709

SWAP VIC VOODOO CASTLE for any other adventure game for Vic20 Tel Swanley 66160

VIC20 ROAD RACE CASSETTE, £4 first letter received accepted sale no cheques M A Vallance 101A Underdale Road, Monkmoore Shrewsbury Shropshire SY2 5EF

INTERTON VC 4000 game cartridges choice of 15 £8 each Tel 0428 56074 after 5 pm

VIDEO GENIE, EG3003 with sound + lower case new £100 software, with manuals £85 Tel Durham 43964

3K JUPITER ACE as new + demonstration cassette hardly used two months old £80 Tel 01 399 5836 4 pm to 9 pm

MICROLINE 80 PRINTER + RS232 interface + forms tractor current new price £330 yours for £230 Tel 01-450 8843 before 5 30 am

48K SPECTRUM new never used unwanted gift, £145 ono Tel 04574 2293 Manchester area, office hours Mr Worsley

DRAGON 32, boxed as new with cords 2 joysticks + software £180 ono Tel 0204 80019 (anytime)

VIC20 cartridges, Rasa Road Alien boxed almost new £11 each Tel 0723 70023.

8K RAM CARTRIDGE + two games for Vic20 £30 Tel Roger Colchester 868188

ZX81 cassettes, 80 £3 each Tel 01-878 8446 (A. Campbell)

VIC20 Swap Super Expander for machine code monitor Tel 061-445 6830 (after 4 pm)

ZX SPECTRUM software swapping. Tel Fareham 235929 for details.

VISICALC for CBM/Pet disc + chip hardly used accept £49 + 4 000 banks tool kit, £15 3000 banks tool kit £19 All perfect Tel Chester 675717

GOT DIFFICULTY IN GETTING TAPES? Well, there is Fareham Portsmouth and Gosport ZX Spectrum Club Tel Fareham 235929

DRAGON 32 + 2 joysticks + 3 cartridges + 3 machine code cassettes + 2 books £255 Tel 01-876 3743 (After 4 pm)

SUPER EXPANDER wanted — swap for Sanyo personal stereo Tel Banbury on Thames 66186 evenings

SPECTRUM software Spectral Invaders, Orbiter Schizoids Night Fire Meteroids £3 20 each or £15 the lot. Tel 0352 57167

CBM 64 + software (games etc) on tape looks brand new only 6 weeks old little used + original boxes £120 Adventure pack one + two are available in shops more details Tel Wells 0749 74784

TEXAS T.I 99 4A + Extended Basic cartridge 3 games and cartridges joysticks, swap for 48K Spectrum Tel Luton 54931

VIC20 software to swap Tel 01 387 8751 8 pm—10 pm

VIC20 GAMES Adventure Land Tank Attack, Defender Chess and more also programming books cost £130 asking £80 ono Tel Guildford 68641

JUPITER ACE complete with leads power supply and manual £70 Telephone King's Lynn (0750) 61568

SHARP MZ80B + 2 disc drives P4 Printer World Star and Merge CPM mint condition Input output board offers Tel 042 873 5947

COMMODORE 64 educational games from £7.95/£15.95 Tel 01-450 4858

VIC20, software to swap or sell Tel 01-387 8751

FIDELITY VOICE Sensory Chess Challenger 64 programmed book opening + Great Games 10 levels of play perfect condition including case £180 ono Tel 01-400 1200 extn 274 (day) 01 388 2544 (evenings)

PART EXCHANGE Apple II EVRO plus 48K + disc card games etc Perfect condition for BBC or Sinclair will collect Tel Brighton 508311 Leicester 0533 702472

ZX81, 16K, + instruction book must be in good condition Londonderry area Tel Londonderry 880831

DRAGON 32, unwanted gift never used, including £50 games + books. £193 ono Tel 0882 759553

C2N cassette unit for Vic20 or Com 64 almost new £38 ono Telephone 01 748 8176 (after 4 30 pm evenings or weekends)

PRINZTRONIC VC6000 Games Console nine cartridges Invaders Spacewar £110 ono Tel Coalville (0530) 36843 (4 pm)

SHARP MZ80K 48K, dust cover software £290 ono Tel Camberley 27871 (6 pm)

SINCLAIR ZX81 16K, full size keyboard + case 12" black and white TV training manual + cassette books 10 cassettes including Chess + Flight Simulation £155 ono Tel 01-088 8865 (evenings)

TI99/4A, 2 months old new accessories, 3 games on cassette + remote controllers + cassette lead + extra leaflet £150 Tel 01 800 1851

DRAGON 32 with 9 months guarantee plus joysticks cooke cartridge Chess etc plus 3 games tapes £200 Tel (603) 408 534 (evenings)

HOME COMPUTER (not ZX81) exchange for Quadrophonic stereo receiver Tel (0677) 700702

JUPITER ACE complete unused + all leads £75 ono Tel 061-928 8281 (evenings)

JUPITER ACE + 6 games £75 ono Tel 01 450 3449

TEXAS instruments, extended basic language cartridge excellent condition £70 Tel Northwood 22558

TI99/4A plus cassette lead with TI Invaders and Munchman cartridges Texas games cassette six months old perfect condition £140 ono Tel Northwood (M ddx) 22558

COMMODORE 16K Ram pack + six arcade games £55 Tel 0606 75119 after 5 pm

SINCLAIR 16K ZX81, £38 Northwood 22750 (after 6 pm)

DRAGON 32, 3 weeks old £58 of software — Defender Donkey King etc £188 ono Tel 01-777 4714 (6 pm)

VIC20, m/c your VIC Commodore cartridge Programme Reference Guide VIC Revealed, + 6502 programmes course £25 Tel 0892 24486

ATARI VCS CARTRIDGE, Space Invaders £10 and Laser Blast, £6 Tel 0264 53600 (anytime)

DRAGON 32, 3 months old as new + software £180 + Sinclair Printer (unused) £40 Tel 0822 53710

MZ80A, 48K, much software, magazines books and other useful items £296 Tel 0788 205198

ACORN ATOM, 12K RAM + floating point Rom plus tool kit Eprom also word processing Rom 8522 via line and 64 way expansion sockets, including power supply dust cover + cassette recorder original arcade games, £290 Tel 01 575 5711

DRAGON 32, 2 months old still under guarantee joysticks + software £190 ono Tel 01 322 8290 (anytime)

DAI 48K improved keyboard + user mags £580 Tel 01-870 5809

JUPITER ACE + manual leads etc £85 Tel 0228 61587

TI99/4A, 9 months old including extended basic etc etc all worth £500 Sell £260 ono Tel 04865-2867

INTELEVISION 2 cartridges Soccer Galaxy Invaders £70 ono 061-538 9279 (5 pm)

JUPITER ACE, brand new + game cassette leads etc £88 Tel Conway 2345

SWAP SPECTRUM m/c Arcade games for any other Spectrum games or adventures Tel 08645 66657 (evenings

6809 GAMES How To Care For Your Computer A Z Book of Computer Games Why Do You Need A Personal Computer? Books for sell cost £38 sell £18 the lot Tel 01 574 4122 (9 am-5 pm)

FIVE ROLLS ZX paper £8 ono Tel Manchester 061 330 5409 (9 pm)

EXCHANGE your software with me Send an SAE to M A Valentine 101a Underdale Road Monkmoor Shrewsbury Shropshire SY2 5EF

8K SPECTRUM original tapes worth £115 + tapes included Hungry Horace, Flight Simulation Schizoids Penetrator Football Manager (phone for full list) Sale price £35 the lot Phone (05827) 69162 for details

12K ATOM 16K Ram + cassette £100 Tel 01-665 1207

PRINTER/TERMINATE KSR 300, RS232C Interface 300 cps tractor drive 80 column, suit most micros with RS232 interface £80 ono Tel 041-638 6411 weekends only

ORIC 1, 48K brand new unwanted gift £180 Tel 041 777 8992.

MATTEL INTELIVISION with 6 cartridges 3 months old £190 ono Tel 01 368 1360

SWAP 1 piece mahogany-based guitar for Dragon 32 or similar Tel 0235 32435

PRINTER Seikosha GP80 boxed as new paper + cable suit most micros, Beed Alarm + Dragon £170 ono Tel 733 4334

DRAGON 32, boxed as new upgrading £180 Tel Cumbran (06333) 66256

TANDY colour computer Project Nemule game will swap for other cart. Tel Pelsall 691618

MATTELL INTELIVISION + 3 cartridges Inc Lock + Chase 3 months old £99 ono Tel Letchworth 72290

CENTRONICS 102DC double header printer standard interface full size 132 column machine Can be used with standard interface e g Dragon BBC £190 with stand Tel 01-466 1188

GAMES First offer for each secures Vic20 Road Race £4 Number Invaders £4 ZX81 16K Prime Minister £3.50 Fat Number Invaders £5 Spectrum Space Raiders £4 M A Valentine 101A Underdale Road, Monkmoor Shrewsbury Shropshire SY2 5EF (Also Vic20 8K Rampack £40

SWAP COMPLETE Home Base CB set up for any colour computer Tel Bradford 0274 682920

DRAGON 32, as new + joystick + lots m/c arcade games + manuals. Cost £293 sell £180 Tel 081 794 8403.

TI 99/4A, all cassette leads + Parsec + Invader Modules + 5 games cassettes + manuals + book £150 Tel Cambridge 862438 eves

VIC20 S/W for exchange 01-387 8751 6—8 pm

SWAP ZX81 GAMES Scramble Hungeroids Tel Leeds 788042 (6 pm)

VIC20 SUPER EXPANDER £25 or swap for 8K Ram. Tel 021 388 4722 (anytime)

EXCHANGE VIC SUPER EXPANDER for 8K Ram Tel Horndean 595800

MICROTAN 65 + Tanmex 8K Ram Sigforth Eprom, a/l graphics Cherry k/b keypad games s/w mini rack, £180 ono Tel 061-445 2468 (anytime)

SWAP PHARAOH'S TOMB multi-screen 16K Adventure for other 16K Adventures (Vic20) Tel Horsham 221108

SWAP a boxed Sargon II Chess Vic20 cartridge for a Lunar Lander cartridge Tel Lisburn (Northern Ireland) 70461

Wanted

WANTED Dragon 32 to swap for Vic20 plus cassette deck, joystick, 3 months old all boxed books and software Tel Fleetwood (Lancs) 4105

WANTED ZX81 16K, keyboard Tel 01-841 2024 (anytime)

WANTED BBC A OR B for cash Tel Goostrey Cheshire (0477) 32063 (anytime)

WANTED Buy rent or timeshare TRS-80 MII with exp drives and printer Any reasonable offer Tel 01-940 2855 (anytime)

WANTED BBC MODEL B with disc interface Tel 061-632 5870 (Glasgow)

INTELLIVISION, sensibly priced please + cartridges to be included Tel 01-897 6274 Bruce evenings

WANTED Disk drives + Expansion interface for TRS80 Model I Level 2 Ring 0633-422328

SECOND-HAND PRINTER Seikosha GP100A or similar Tel 01-942 5026

DISC DRIVE for BBC Model B Derby area Tel 0332 772685

WANTED BBC (B) with software Tel 01-204 4534 (7 pm)

BBC MODEL B Tel Tollerton 258412

ANY COMMODORE TANDY, SHARP will pay £250 ono Tel 061 282 5054 Mr Ibrahim

VIC PROGRAMS and other cartridges in exchange for software Tel 01-807 6907

WANTED any Vic cartridges half price Winchester (0962) 53240 (6 pm)

BBC MODEL B Tel Swansea 206590

BBC MODEL B Tel Godalming 22267



CRASHING BORE!

Martyn Sadworth of Bristol, writes

Q I have recently acquired a Jupiter Ace. It does not take long to discover that, with less than 1K of memory available (after the character set, and both the stacks are accounted for), it is insufficient even for Forth.

I therefore tried to fix my ZX 16K Ram pack to the Ace by means of an adapter (to get the connections in the right order). Nevertheless, the computer crashes with the 16K Ram fitted as soon as it is turned on.

A I think you are brave to try a wiring job like this — it must look a bit like spaghetti. Assuming that you have taken note of the end of page 155 of the manual, where it says that the Ram CS and the Rom CS on the ZX81 should not be connected up, then it must, I am afraid, be a wiring mix-up.

While on this subject, D Barlow of Lansbury Drive, Hayes, Middlesex, has tried the same thing with a Memotech 32K Ram pack. He found that the only way he can get the Ace to address this particular pack, is by 'linking out the Rom CS to the Ram CS, on the ZX81 side'. I can only assume that this is because the Memotech memory actually disables the Rom to enable it to read the screen.

D Barlow also asks why, when he has the pack fitted, he gets the result *−31879* when he does a test to see how much memory he has left — and would it be possible to fit an ordinary keyboard to the Ace.

The reason for the return of *−31879* value is given on page 24 of the manual. The numbers 'wrap around', so you get the last address of the 32K block as, 32767, the next addresses are returned as *−32768, −32767* and so on. So you can see that you have almost 33K of User Ram available with this pack fitted.

A normal keyboard could be fitted to your Ace, but it would take a careful analysis of the position of each data and address line.

UNSTOPPABLE NOISE

L K Matusczczyk of Trelaw Road, Trelaw, Rhonda, Mid-Glamorgan, writes

Q I have had a 16K Spectrum since October. When I connected the power supply, I was a bit surprised to hear a loud buzzing noise, which came from the computer. I telephoned Sinclair Research and a young lady told me that the Spectrum does buzz and, as the computer seemed to be OK otherwise, she would not recommend that I return it.

Is it reasonable for the Spectrum to make this noise? I must confess that it irritates me after a while. What causes it, and have you any ideas on how to reduce it?

A All Spectrums seem to buzz to a greater or lesser extent. Nevertheless, it does not mean the Spectrums aren't any good — the cause is usually the winding in the modulator. I cannot think of anything you can do to stop the noise.

IN SHORT SUPPLY

Lawrence Stevens of Sale, Manchester, writes

Q I think I am having trouble with the power supply for my Dragon. I have recently moved and now every so often the television screen goes fuzzy (even though it is the same television as before). Occasionally, I get problems with software that I have *Loaded* on my own and has previously had no faults.

I lent my computer to a friend for a few days, who lives where I used to live. No problems. A local electrical shop said something about a poor power supply in this area and suggested a filter on the power lead. He did not know where I could get one. Do you?

A I am a little surprised that he did not know where to get a filter of some sort, but there is at least one on the market. It is called 'The Plug' and is available from Power International Limited, 2a Isambard Brunel Road, Portsmouth, Hampshire PO1 2DU.

The problem you face is not unique, but as a matter of course I would suggest a wiring inspection of your house.

THE DREADED WOBBLE

P H Cooke of East Crescent, Stocksbridge, nr Sheffield, writes

Q I have noticed several machine code programs that can only be Run on a 1K ZX81, or a machine with less than 3.25K of Ram. I have firmly attached my Ram pack to the back of my ZX81, to stop the dreaded wobble problems. Short of removing the pack, is there any way I can get these programs to Run with the Ram Pack attached?

A Yes, and it is tied up with the way the ZX81 stores the screen in the display file. If you have less than 3.25K, then when you first switch on the display file contains just 25 bytes, a *Newline* character for each line. As material is entered, the display file fills up, from left to right. This is why it is best to keep 1K displays in the left-hand corner of the screen, and also why each line in the display file contains 33 bytes.

If you have more than 3.25K, then 792 bytes will be reserved for the display file, ie, a completely full screen.

The way around your problem is to fool your ZX81 into thinking that it has less than 3.25K of memory. This can be done by lowering Ramtop. When the command *New* is used, it clears everything in the memory up to *Ramtop*. If this is lowered, then the machine will be fooled into thinking that it has less memory.

The only way to access information above Ramtop in Basic is by *Peek* and *Poke*. If you *Poke* any address below 20700 into the variables that control Ramtop, you will lower it enough.

The variable that controls Ramtop is 16388/9. 16388 has to be *Poked* with the low byte of the address you want to lower Ramtop to, and 16389 with the high byte. If you want to lower Ramtop to 1K, then this program will do it:

```
10 LET A = 17407 (The address at the end of 1K of Ram)
20 LET H = A/256 (This will give the high byte)
30 LET L = A - INT (H * 256) (This will give the low byte)
40 POKE 16388 L (Putting the new value into the systems variable)
50 POKE 16389 H (Putting the new value into the systems variable)
```

WORTH THE WAIT?

A Herbert of Adam Road, London N6, writes

Q I have heard that Sinclair is going to bring out a new computer quite soon. I was thinking of up-rating from my ZX81 to a Spectrum, but would it even be worth waiting for the new computer?

A Lots of speculation on this, but unfortunately, very little by way of hard facts to go on. Probably, the new computer will be more business orientated than the previous machines and flat screen television, and microdrives will probably be included.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

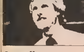
Top 10

Books

1 (3) Assembly Language Programming for the BBC Micro *Birnbaum* (Macmillan)
2 (1) Enter the Dragon *Carter* (Melbourne House)
3 (8) Spectrum Machine Language for the Complete Beginner *Tang* (Melbourne House)
4 (2) Creative Graphics on the BBC Micro *Cownie* (Acornsoft)
5 (—) Mastering the Vic20 *Jones* (Horwood)
6 (4) The Working Dragon 32 *Lawrence* (Sunshine)
7 (7) Programming the Z80 *Zaks* (Sybex)
8 (—) The C Programming Language *Kernighan* (Prentice Hall)
9 (5) Compute!'s First Book of Vic, *various authors* (Compute!)
10 (—) Mastering CP/M *Miller* (Sybex)

(Figures compiled by Watford Technical Books, Watford, 0923 23324)
(Last week's position in brackets)

Ziggurat



A spell on the computer

I have just calculated (on my new clock calculator) that the square root of −81 is 9. I cannot perform any more calculations because it seems to be jammed then I notice a tiny E in the upper left-hand corner. If I was an unaware user I might not notice the E and carry on working.

Richard Skemp (writing in *The Psychology Of Learning Mathematics* Penguin Books 1971) notes that problems of learning and teaching mathematics are *psychological* problems and that before we can make progress in teaching such things as mathematics (and programming?) we need to know much more about ways of learning. He might have added that different people learn in different ways, though some might learn by Papert's methods, some with poor visual imagery might find it almost impossible to learn merely by use of visual methods (psychologists distinguish between imagers and non imagers — say no more!)

If we think of simple sums, Skemp notes that "to understand arithmetic is an impossibility for much of the algebra we learn at school is generalised arithmetic. This is why I believe that it is not possible to be a superior programmer without being in possession of a good *concept* of number (personally my arithmetic is poor!)

To program is not to use mathematics in one sense but to program is to use logic and logic has its basis in arithmetic.

I also believe that a *good* programmer should have a good command of the English language when I read some of the so-called books on programming which fill the bookshops and curse their illiteracy, this is reflected in the utter poverty of many of the programs.

A few years ago an attempt was made to introduce backward adolescents to computers to see if the new environment could tease out their innate ability. It was reasonably but not very, successful. It was found that boys who could not add up well played number-guessing games with facility (given time) but the biggest drawback to progress was that, to obtain a list of programs on the disc one had to type *Catalog* (it was an American computer) with no ue. For some *educated* people confusion ensues but these boys did not see the problem — they could spell neither version.

I sometimes wonder if the reason why the Sinclair machines have been so successful at so many levels is that they use single keywords entry so that the user does not have to spell. That a good proportion of software writers cannot spell is obvious from reading the documentation and program output.

One of my worries about the concentration upon computers in schools by the present government is that useful and essential skills may be down-graded merely because of that emphasis. One reaction to this type of argument is "It doesn't matter before long all input and output will be audio so people will not need to read or write". I leave you to guess my reaction to that type of attitude!

Finally back to logarithms. Skemp (writing in 1971, remember) notes "In these days of electrically-operated calculators and computers there are some who think that logarithms and slide rules are out of date. But a book of mathematical tables costs pence, a slide rule a few pounds. Whereas an electric calculator costs hundreds of pounds, a computer thousands." ■

Boris Allan

Puzzle

All square!

Puzzle No 48

They were laying floor tiles at the local community centre.

"Managed to get this lot cheap," said Ned, indicating the tiles. "We found the kitchen, cloakroom, lobby and committee room were all perfectly square and measured an exact number of feet along each side. Not only that but the kitchen was six feet smaller along the side than the cloakroom, the cloakroom was six feet smaller than the lobby and the lobby was six feet smaller than the committee room."

"I see," I replied, spotting a contrived puzzle. "But you haven't mentioned the main hall."

"That'll have to wait," replied Ned. "You see we only have the exact number of tiles to do the four smaller rooms. To be able to do the hall we would need as many again."

If the hall is also square and an exact number of feet, what are the sizes of the rooms?

Solution to Puzzle No 44

If we call the distance from the top of the furthest flag pole to the peg r, the height of the poles p, the distance of the peg from the nearest pole x and the distance between the two poles q then, using Pythagoras theorem

$p^2 + (q + x)^2 = (r - \sqrt{p^2 + x^2})^2$

With a little juggling this becomes

$4(q^2 - r^2)x^2 + 4q(q^2 + r^2)x + (q^2 - r^2)^2 - 4r^2p^2 = 0$ and writing $s = q^2 - r^2$ gives $4sx^2 + 4qsx + s^2 - 4r^2p^2 = 0$

Using the program with the values of p, q and r

```
10 P=50 Q 75 R 150 20 S=Q↑2 − R↑2 30
A=4*S B=Q*A C=S↑2 − 4*R↑2*P↑2 40
D=SQR(B↑2 − 4*A*C) 50 X1 = (−B+D)/
(2*A) X2 = (−B−D)/(2*A) 60 CLS PRINT "THE
ROOTS ARE" X1 "AND" X2
```

This gives the two answers of 19.03 and −94.03. So the peg is 19.03 feet from the nearest pole. The other root refers to a possible corresponding peg 19.03 feet out from the *other* pole.

Winner of Puzzle No 44

The winners are Ms P Haynes and Ms C Johnson of the Upper Fifth, Queen Mary School, Lytham, Lancs, who receive £10.

Top 10

BBC

1 (6) Planet[illegible] ([illegible]soft)
2 (—) Chess ([illegible] Power)
3 (—) Snapper (A[illegible]soft)
4 (5) Tree of Knowledge (Acornsoft)
5 (—) Creative Graphics (Acornsoft)
6 (4) Castle of Riddles (Acornsoft)
7 (—) Frogger (A&F)
8 (—) Graphs and Charts (Acornsoft)
9 (2) Chess (Computer Concepts)
10 (—) Forth (Acornsoft)
All Model B
(Figures compiled by Micro Management, Ipswich 0473 59181)

Vic20

1 (2) Laz[illegible] (Llamasoft)†
2 (3) Gridrunner (Llamasoft)
3 (—) Abductor (Llamasoft)
4 (7) Krazy Kong (Interceptor Micros)
5 (—) Hopper (Rabbit)
6 (10) Night Crawler (Rabbit)
7 (5) Andes Attack (Llamasoft)†
8 (8) Quackers (Rabbit)
9 (—) Sargon II Chess (Commodore)
10 (8) Traxx (Llamasoft)†
Cartridge †Requires 8K or 16K
(Figures compiled by Vic Centre, London 01 992 9904)

Spectrum

1 (3) Penetrator (Melbourne House)
2 (7) Vu 3D (Psion)
3 (10) The Hobbit (Melbourne House)
4 (5) Frogger (A&F)
5 (8) [illegible] (Microgen)
6 (—) Flight Simulation (Psion)
7 (—) Micro Chess (Artic)
8 (1) Black Crystal (Carnell)
9 (8) Galaxians (Artic)
10 (—) [illegible]Man (Campbell Systems)
Requires 48K
(Figures compiled by Buffer Micro Shop 01 769 2887)

Atari

1 (—) Zaxxon (Datasoft)
2 (—) Chopper Rescue (Microprose)†
3 (—) Eastern Front (APX)
4 (1) Defender (Atari)
5 (—) Eliminator (Adventure International)
6 (—) Hell Cat Ace (Microprose)†
7 (2) Miner 2049er (Big Five)
8 (—) Floyd of the Jungle (Microprose)†
9 (—) Preppie (Adventure International)
10 (—) GFS Sorceress (Avalon Hill)
Cartridge †32K cassette ‡48K cassette/disc *48K disc
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

ZX81

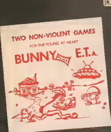
1 (3) Galaxians (Artic)
2 (4) Flight Simulation (Psion)
3 (8) 3D Defender (JK Greye)
4 (2) Kong Dracula (Tony [illegible])
5 (—) Maze Man (Abbersoft)
6 (—) Chess (Artic)
7 (—) Do Not Pass Go (Workforce)
8 (—) Mazogs (Bug Byte)
9 (—) Centipede (Llamasoft)
10 (—) Oracle's Cave (Dorcas)
All 16K
(Figures compiled by Buffer Micro Shop, London 01 769 2887)

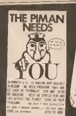
Dragon

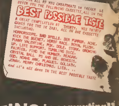
1 (1) Planet Invasion (Microdeal)
2 (2) Dragon Trek (Salamander)
3 (5) Alcatraz II (Microdeal)
4 (3) Space Race (Computerware)
5 (—) Donkey King (Microdeal)
6 (6) Invaders Revenge (Microdeal)
7 (—) Champions (Peaksoft)
8 (—) Attack (P.S.S.)
9 (7) Ghost Attack (Microdeal)
10 (4) Scarfman (Microdeal)
Cartridge
(Figures compiled by Dragon Dungeon, Ashbourne 0335 44626)



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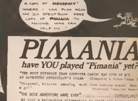






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